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THE

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THE

QUARTERLY JOURNAL

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NOVEMBER, 1918

THE WHEAT AND FLOUR TRADE UNDER FOOD ADMINISTRATION CONTROL: 1917–18

SUMMARY

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THE act authorizing the President to establish agencies for the control of foods and fuels was approved August 10, 1917. Under its provisions the Food Administration was at once given legal standing and began to function as the directing and controlling authority in the food trades of the United States. Sufficient time has now elapsed to permit a review and critical estimate of the activities of the Food Administration, in certain

directions at least. Easily the most important of its problems, and in some respects the most difficult, have been encountered in the regulation of the wheat and flour trade. In this paper an attempt is made to analyze these problems and to discuss the efficacy of the measures adopted to meet them.

I

The Commercial Situation and Price Trend during the Crop Year, 1916–17

In 1913, in 1914, and again in 1915, the United States produced the largest wheat crops ever harvested in this country; the average for the three years was almost 900,000,000 bushels. The average exports of wheat (and flour) for the same years were almost a quarter of a million bushels; the exports for the years 1914–15 and 1915–16 were much the largest recorded during the present century. In striking contrast to these huge crops was the exceedingly disappointing harvest of 1916, which amounted to only 636,318,000 bushels. However, there was a large "carry-over" from the 1915 crop, amounting at the beginning of July, 1916, to 179,174,000 bushels, which, together with the new crop, made possible an export movement of 209,438,795 bushels during the succeeding twelve months.

It is the occurrences of these twelve months to which this paper must first give attention. The facts just recited make it evident that during the first two years of the European war this country had played a large part in the provisioning of western Europe. The neutral nations as well as the entente allies had drawn very heavily upon the United States for wheat and flour, but it had also been possible for them to draw upon the

crops of Australia, Argentine, India, etc. To a lesser extent this was possible also in 1916–17, but the growing scarcity of ocean tonnage caused greater and greater dependence upon nearer sources of supply, as Algeria and North America. The result was an extremely close adjustment of supplies and needs during the year 1916–17; on July 1, 1917, the United States came into the new crop year with a carry-over of only 51,078,000 bushels; — the lowest figure recorded since 1909.

Not only was there a remarkably close adjustment of supplies to needs during the twelve months ending in June, 1917, but there was also, over the greater part of that period, an almost continuously mounting price level for wheat and flour. Only between November, 1916, and early February, 1917, did a net decline occur; after the first week in February there was a sharp upward swing which reached a climax about the middle of May, at a point nearly three times as high as the prices current a twelvemonth before. This peak was not maintained, but the average prices of June and July were well over twice the level of the corresponding months in 1916.

This extraordinary price increase was due to three fairly distinct factors: (1) poor crop prospects and rapidly diminishing wheat and flour stocks in the United States and Canada; (2) uncontrolled, and at times apparently reckless, buying in American markets by the representatives of the allied and neutral countries; (3) the impossibility of drawing upon the reserves of such distant regions as Argentina, Australia, and India, in appreciable quantity, owing to the ever-shrinking supply of merchant shipping resulting from the destruction of tonnage by unrestricted submarine warfare. The urgent needs of western Europe had to be met from

the scanty surplus of North America. As it has been well put:[1] "Wheat and the products of wheat became war munitions, and war munitions are bought with a ruthless disregard of all commercial factors." Under such conditions the ordinary conditions of demand and supply can hardly be said to exist at all. In a sense, the law of demand and supply was simply inoperative. There resulted an abnormal and quite unprecedented condition in the wheat and flour market of the United States during the spring of 1917. The highest price paid for cash wheat since the Civil War was reached in April; by the middle of May it had advanced nearly 50 per cent more. Curiously enough, high prices of wheat and flour had the effect of stimulating rather than checking the buying demand of American distributors and consumers. Flour consumers were frightened at the prospect of impending scarcity, and their fears were not allayed by the very gloomy reports issued by the Department of Agriculture on the condition of the winter wheat crop and the injudicious utterances of its officials and other public men concerning possible famine conditions to come. There resulted a veritable flour panic; with each successive increase in prices there was a fresh wave of hysterical buying; speculation by flour jobbers and dealers, as well as by wheat operators, was rampant. Extraordinary profits were taken, in many cases almost reluctantly taken, both by millers and grain dealers. Predictions were freely made by responsible officials that still higher prices might be expected unless the market was controlled. The buyers for the foreign governments had well-nigh cornered the market through their ownership of the May future; the market was really "oversold" and the selling interests wanted some action taken to protect them from excessive loss. Finally, on

[1] By Mr. Julius H. Barnes, President of the Food Administration Grain Corporation.

May 14, under pressure from government officials and from public sentiment, the directors of the Chicago Board of Trade prohibited further trading in the May future and forced the settlement of outstanding contracts at a price fixed by a committee. With cash wheat selling at $3.45 the committee set a maximum price of $3.18 for the May contract. Subsequently speculative trading in the July and September futures was also prohibited and outstanding contracts terminated. The committee fixed the settling prices on these contracts at $2.75 and $2.45 respectively. Similar action was taken by the other important exchanges. "The moment this was done," to quote the words of a keen observer,[1] "the whole American marketing system fell like a house of glass."

II

Evident Necessity for Government Control

In these conditions it became abundantly evident that some form of control was necessary if the situation was not to get out of hand altogether. As early as April, 1917, the Council of National Defense had summoned Mr. Herbert C. Hoover, who had discharged with signal success the perplexing and difficult task of rationing the Belgian nation, to come to the United States to undertake a similar task for his own country. Mr. Hoover arrived in Washington early in May, but found the political situation so unsettled as to make it extremely doubtful whether he could render useful public service. It is not the purpose of this paper to trace the tortuous course of the so-called Food Control Act through the debates of Congress; suffice it to say that many interests were arrayed against the appointment of a business man

[1] Mr. Julius H. Barnes.

to a position of real authority in Washington. However, Mr. Hoover had the backing of the President, and he proceeded at once, tho unofficially, to the working out of plans for the effective control of the food industries which might be put into operation as soon as authority was granted to do so. The first important industry to be considered was the wheat and flour trade.

The next few months were a period of anxious waiting on the part of the commercial interests affected. Already in April the Council of Grain Exchanges had sent representatives to Washington to confer with the Secretary of Agriculture and to work out some plan of control acceptable to the government and the trade. Out of these consultations was organized the Committee of Grain Exchanges in Aid of National Defense. This committee together with a somewhat similar committee representing the western exchanges, met in conference with Mr. Hoover on May 16, and at his request submitted a tentative outline of a plan of control. This plan emphasized: the absolute necessity of direct government control of the transportation of foodstuffs (interchange of railroad cars, etc.); the fixing of a wheat price and its maintenance for the entire crop year without change; the control by the government of the distribution of the available wheat supply, and, as a means to this end, such control over terminal and country elevators as to deprive everyone, except the government, of their facilities for the storage of wheat (and rye); the discontinuance of trading in futures in wheat on the grain exchanges; and the limitation of the practices, by consumers, of buying flour far in advance, and by mills, of contracting for the sale of flour further ahead than "prompt shipment." This remarkable document foreshadowed many of the most important policies which were later adopted by the Food Administration. The

conclusion was reached at these conferences that, with the elimination of waste and proper conservation in this country, an ample supply of grain would be available, both for domestic consumption and for the requirements of the Allies. The problem was, therefore, one of administration; the creation of a Food Administration was the logical recommendation.

Coincidently the flour milling industry had become alive to the necessity of some stabilizing action by public authority, and at the inspiration of Mr. W. C. Edgar, editor of the *Northwestern Miller*, sought to get the support of Mr. Hoover in a scheme for the reduction of wheat prices and in a plan of milling regulation which would be acceptable to the trade. In May, Mr. Hoover met some of the leading millers in conferences and received suggestions for a plan of government control. Some of these suggestions were of a drastic and far-reaching character, based upon the authority granted to the President under the National Defense Act. They extended to the requisitioning of grain at country points of shipment, the pooling of all terminal elevator facilities at the primary markets, the fixing of prices on all grains and on flour, the placing of an embargo upon exports of grain and grain products, and the direction of all export movement by the food controller. These suggestions were deemed impracticable or their execution considered unwise; it was evidently the preference of the President to wait for specific authorization by Congress rather than to exercise the war powers conferred in general terms under the Defense Act.

Another set of suggestions was contained in a letter of May 27, to Mr. Hoover, signed by ten prominent representatives of the milling trade who had been in Washington in discussion of the Lever food control bill before Congress. These representatives urged the absolute

necessity of a national food administration, and desired immediate action because of the pressure of forward contracts covering the purchase of new wheat and the forward sale of flour. They recommended that the food controller be given authority over the transportation of foodstuffs both by lake and rail; that all foreign buying of foodstuffs be under the jurisdiction of the food controller, with a view to effecting a fixed price of grain, and perhaps of grain products; that a maximum price be fixed on flour; that relative prices be fixed on coarse grains (corn, oats, barley, etc.) with reference to the prevailing price of wheat, so as to encourage their use and insure the conservation of wheat flour; that the practice of buying flour for long deferred shipment be discontinued; and that a "milling executive" composed of members of the milling industry be designated to act as intermediaries between the proposed Food Administration and the milling trade with a view to enlisting the helpful coöperation of millers generally.

A suggestion somewhat similar to this last idea was contained in a brief submitted to Mr. Hoover on June 10 by Mr. W. C. Edgar. This interesting paper called attention to the state of demoralization existing in the milling industry, growing out of the inability of the millers, unaided, to remedy the existing trade deadlock, in view of the price-fixing debate in Congress and the prevailing uncertainty as to what would be done and when. Conditions had really become critical; many millers were afraid to buy wheat, since the hedging market was closed and there might be sudden and arbitrary change in the wheat price through Congressional action. They were also unwilling to accept orders for flour, except those specifying immediate shipment, in view of the probability of repudiations if prices should be reduced. Many mills were, therefore, greatly

curtailing their output, just at the moment when commercial stocks had already been reduced to a dangerously low point.

The winter wheat crop was already beginning to move in the Southwest and the millers needed some assurance as to what would be done before they could with safety handle this wheat. Therefore, Mr. Edgar suggested that, without waiting for action by Congress, the Food Administrator, acting under the President's authorization, proceed to organize the milling industry on a co-operative basis for the purpose of working out definite plans for the regulation of the trade. A scheme of organization was proposed calling for the appointment of a Milling Executive or General Chairman, eight heads of divisions, one for each of the eight milling geographical sections of the country, and twenty-nine heads of sub-divisions. These were all to be active millers and were to receive their appointments from the Food Administrator; the whole organization to be an advisory body, appointed tentatively to work out the machinery for the control and administration of the milling industry, which could be put into operation immediately upon legal authorization by Congressional action.

This course of action was decided upon by Mr. Hoover, who on June 22, appointed a committee of nine leading members of the industry, representing the several sections of the country. This body, known as the United States Millers' Committee, conceived its duties as the perfecting of a self-controlled organization of the milling industry, acting in conjunction with the proposed Food Administration. On June 28 it reported a plan which embodied some of the principles ultimately adopted as the basis of the milling regulations. The most important single feature which had been elaborated at this time was the scheme for control-

ling flour prices. It was proposed that under the intra-trade agreement each mill should be entitled to sell its products on a cost plus profit basis, provided the cost of manufacturing and marketing did not exceed seventy-five cents per barrel, while the amount of profit was to be limited to twenty-five cents per barrel; the quantity of wheat that might be used in making a barrel (196 pounds) of flour was limited to 4.75 bushels (285 pounds) — a rate of flour extraction equivalent to 69 per cent. These were liberal figures, but they were deemed necessary for the accommodation of the less well equipped mills whose coöperation in the regulatory plan it was considered essential to obtain.

This whole plan for self-regulation of the industry, under the supervision of practical millers, was predicated upon the ability of the Millers' Committee to secure an agreement on the part of the mills respecting the allocation of business among them on the basis of their average output for the three preceding years. This was to be brought about by the proportionate allotment of wheat to the mills under government direction; export orders and government contracts were to be awarded on a pro rata basis to the mills through a central selling agency. By voluntary agreement the mills were also to limit their sales of flour to a period thirty days in advance; a uniform sales contract was to be used. To pay the expenses of administration a monthly assessment of one cent per barrel of output was to be levied on all mills entering the organization.

To this plan of milling regulation Mr. Hoover gave his approval in general terms, and he proceeded to the formation of the regional sub-committees but refrained from committing himself to specific plans until legal authority was granted. Early in July the Millers' Committee sent an announcement to the trade (through the

offices of the Millers' National Federation) setting forth what had already been accomplished in voluntary organization; millers were requested to signify their willingness to coöperate in the further work of the Committee. Within a few weeks favorable replies were received from mills representing a majority of the producing capacity of the country.

III

Slow Progress of Legislation

Meanwhile legislative action still dragged, and altho prices had receded from the high levels of May and early June, which materially reduced the difficulties of the mills in effecting the adjustment from the old crop to the new, the mills quite generally still refrained from buying wheat or selling flour ahead because of the risks of a declining market. In the absence of a hedging market it was impossible to bridge the gap between the current high prices of wheat and flour and the prospective lower prices when the new crop should be harvested.

On June 18, President Wilson made public a letter addressed by him to a member of Congress in which he urged the quick passage of food legislation in order that prices of foodstuffs might be reduced by putting a stop to speculation. The President declared that legislation was urgently needed before July 1, if the country was to be made safe from these dangers of speculation and oppressively high prices.

July 1 came and went, but with it came no food legislation. On July 11, the President gave to the press a letter from Mr. Hoover which called attention to the perils of delay. This statement rehearsed the fact that the farmers had received an average price of $1.51 per bushel for the 1916 wheat harvest, while the price at

Chicago had gone as high as $3.25. Flour prices are based upon current, i. e., "speculative" wheat prices; thus the consumer had been made to pay as much as 100 per cent more than the producer had received. This great increase in the margin between producer and consumer was due not so much to vicious speculation as to the fact that every link in the distribution chain had found it necessary to exact wider profit margins in order to be insured against the risks of widely fluctuating prices during a period when practically all normal price stabilizing agencies had been disrupted by the effects of war. A consequence was that large masses of people were actually being undernourished in the great consuming centers, due to the exorbitant cost of living.

Mr. Hoover's statement also called attention to the consolidation of Allied buying into the hands of a single agency, the Wheat Export Company. Thus the export price became subject to the will of this one purchaser. Not only this, but the growing shortage of ocean tonnage would necessitate spreading the export movement of the new crop over a considerable period, whereas it had normally been concentrated into the fall months. The result would probably be a serious glut in the interior terminal markets, which would place an added strain on the financial resources of the legitimate grain trade and probably necessitate the assistance of a considerable speculative element. The necessity of reliance upon the speculative element to carry the surplus stocks which would result from physical restrictions upon freedom of export movement indicated that the speculators' toll would inevitably be levied again upon both producer and consumer. To protect the farmer from a disastrous slump in the price of his wheat resulting from a glutted market, some strong and efficient government action was absolutely necessary, not only to secure a just

return to the wheat grower, but in order to stimulate production for the next year. The necessary and desirable kind of action was that the government should buy the surplus wheat at some reasonable minimum price, and by so doing stabilize the market for the benefit of both producer and consumer. The speculator could thus be dispensed with altogether.

To meet the peculiar conditions prevailing in the midsummer of 1917 it had been suggested that the Wheat Export Company enter into an agreement to protect the mills from loss on their unsold wheat and flour which might be occasioned by sudden and arbitrary reduction of prices through government action. Under normal conditions of business it is a regular feature of the operations of most flour mills to seek orders for flour far enough in advance of delivery to insure continuous and uninterrupted grinding; this implies contracting ahead for supplies of raw material. But with the conditions existing in May and June of 1917 it was unsafe for a mill to make new forward sales, since new purchases of wheat for future delivery were forbidden by the emergency rules of the exchanges; and to accumulate "unsold" stocks of wheat was a pure gamble. As the largest single buyer in the market, it was apparent that the Wheat Export Company would be the chief beneficiary by the expected reduction in wheat and flour prices. Some tentative arrangements were, in fact, entered into: the Export Company undertook to "take up the slack" between the millers' unsold and unhedged wheat and flour at the basis of $2.00 per bushel, Chicago, and any price below that figure which might be established by government action. At no time during June or July did the price approach $2.00, however, and on July 12, owing to the delay of Congress to enact legislation, the Wheat Export Company withdrew its assurance.

IV

For the next month wheat prices approximated the $3.00 mark at the principal interior terminal markets. It was not until August 8, however, that the Food Act was finally passed in a form acceptable to the President. The preamble to the Act recited that the existence of a state of war made it essential to assure an adequate supply and equitable distribution, and to facilitate the movement of foods, feeds, fuel, implements, etc. (defined as " necessaries "); to prevent scarcity, monopolization, hoarding, injurious speculation; and to establish and maintain governmental control of such necessaries during the war. When it came to a definite grant of powers, however, the Act was as significant for what it omitted as for what it contained. There was no specific reference in it to a Food Administration; the powers of control over the food purveying industries rested (almost wholly) upon the licensing provisions, under which storage charges, commissions, practices, and profits were required to be just, reasonable, non-discriminatory, and fair, under penalty of revocation of license. The only price-fixing authorized, aside from that of coal and coke, was the minimum guaranteed price to the producer of $2.00 per bushel for wheat of the 1918 harvest; this minimum guarantee was designed to stimulate the planting of a large crop in 1917–18. The President was authorized to buy, store, and sell wheat, flour, meal, beans, and potatoes; for this purpose the sum of $150,000,000 was appropriated. The Act contained stringent provisions against the destruction, waste, or hoarding of necessaries, and against conspiracies to restrict their supply or enhance their price. Farmers, however, were specifically exempted from the

provision against hoarding. The President was authorized to requisition foods, feeds, and fuels for public use, and storage facilities for the same, as well as factories, pipe lines, mines and other plants used in their production. He was also given practically absolute power over the operations of produce exchanges and boards of trade and the transactions carried on therein. A provision of signal importance for the regulation of the grain and flour trade was the authorization of voluntary agreements for carrying out the purposes contemplated by the Act.

The Food Act was approved on August 10, and on the same day the President appointed Mr. Hoover as Food Administrator. Mr. Hoover announced the aims of the Food Administration as threefold: (1) to regulate the trade so as to eliminate vicious speculation and to stabilize prices; (2) to guard exports so as to retain sufficient supplies of foodstuffs within the country for domestic use; (3) to stimulate food saving and conservation so as to set free for export to the Allies as large a quantity of food as might be necessary. Three months previously Mr. Hoover had announced that the task of food administration could be successfully accomplished through the voluntary coöperation and direction of legitimate distributors of foodstuffs and with the help of the women of the country. Already the latter part of this program had been put into operation under the direction of the President, without waiting for legal sanction by Congress. A well organized and widespread conservation campaign was launched in June. There remained the complex task of perfecting the policies of trade control and regulation.

The machinery which had been elaborated for the control of the wheat and flour trade was the first to be set in motion. On August 12, the plans of the Food

Administration for the control of wheat, flour, and bread were announced. Attention was called to the disruption of the world's normal wheat markets (owing to short crops in many producing countries, lack of ocean tonnage, and unavailability of accumulated stocks in certain countries cut off by belligerent lines), and the consequent demoralization of the regular commercial price-making agencies for wheat; to the fact that the Allied governments had centralized their wheat purchasing in the United States and had thus acquired a dominating position in the buying market; to the possibility of an early termination of the war and the consequent release of large stocks of wheat from sources currently unavailable as a further unsettling factor. All these considerations pointed to the necessity of some efficient government action to stabilize wheat prices for the protection of both producer and consumer. To meet this situation the Food Administration announced its intention to open agencies at the principal terminal markets for the purchase of all wheat that would be offered, at a fair price which would be maintained through the entire harvest year 1917–18. If necessary, the Food Administration would take the whole harvest in order to maintain a fair price. It was planned to resell wheat to the flour millers, and for export in limited quantities. The grain exchanges were asked to suspend all dealings and quotations in wheat futures, beginning with September 1; further to reduce speculation in wheat and flour, all elevators and all mills of over 100 barrels daily capacity would be required to take out a government license, the chief conditions of which were that only reasonable and customary charges should be made for warehouse service, and that no wheat should be stored for more than thirty days without the approval of the Food Administration.

On August 14 was announced the incorporation of the United States Food Administration Grain Corporation, organized under the laws of the state of Delaware, for the purpose of controlling the wheat supply; the entire capital stock of $50,000,000 was to be held by the United States government. The Grain Corporation was designed as the agency through which the Food Administration would make its purchases of wheat at the terminal markets, and also arrange for the control of exports of wheat to the Allies and to neutral nations. The Food Administration announced that in its control over exports it would stipulate for a large proportion of export of flour instead of wheat, and in this way encourage a large home production of flour and thus reduce manufacturing costs, and secure to the American public the benefit of lower conversion and distributing costs, as well as provide a large supply of mill feed for the livestock and dairy industries.

In the meantime the provisional organization of the United States Millers' Committee had been confirmed by the President. The committee assembled at Chicago, August 14–15, where the plans for the regulation of the milling industry were worked out in detail. The whole country was divided into eight (later nine) districts, each with a milling executive at its head; a committee of representative millers was appointed in each district and administrative offices set up at the divisional headquarters; a central office was established at New York; each member of the central committee was made divisional chairman over his own district; and the entire structure was designated the United States Food Administration Milling Division.

V

Through the Milling Division a voluntary agreement was entered into with the Food Administration by several hundred millers providing for the regulation of the industry; voluntary agreements were also made between the millers and the Grain Corporation. The chief provisions of these agreements were that the mills should not pay a higher price for wheat than the fair price adopted by the Food Administration for government purchases; that the Grain Corporation should guarantee the mills against a loss by decline in the value of their unsold wheat and flour below the government price basis, bought during the period of the agreement; that the Grain Corporation should endeavor to maintain in available positions an adequate supply of suitable wheat to meet the milling demands of the mills, and secure an equitable distribution of wheat between the mills on a pro rata basis; — each mill's quota was to be proportionate to the ratio that its average grind during the three years 1914, 1915, 1916 bore to the total average grind of all the mills during that period, due allowance being made for new capacity; that the millers should operate their mills at a profit not to exceed twenty-five cents per barrel on flour, and fifty cents per ton on feed — about two cents per barrel of flour additional; that they should make a return upon oath of their profits earned during each month; that they should not contract to sell flour more than thirty days in advance (thus reducing speculative buying); that they should not store wheat without the permission of the Food Administration for more than thirty days' supply; and that the Grain Corporation should apportion over the entire milling trade all export sales of flour.

The Food Administration took the view that it did

not possess legal authority to prescribe prices: hence the method of voluntary agreement. The difficulties of the situation were very great. At the date of the passage of the Food Act, August 10, the price of cash grain at Minneapolis was around $3.00 per bushel while the September future was quoted nearly $1.00 per bushel lower. The Millers' Committee had hoped to get the sanction of the Food Administration to an intra-trade agreement to force down prices, but at the last moment (August 24) the Attorney General's office ruled that such an agreement was in conflict with the anti-trust laws, and it was necessary to abandon it and substitute in its place an individual agreement between the Food Administration and each miller. This altered the whole legal aspect of the plan of regulation adopted. Under the earlier arrangement the Millers' Committee had represented trade autonomy and proposed to operate in conjunction with rather than under control of the Food Administration; as finally worked out the Milling Division became a subordinate branch of the Food Administration, and its members became officers of the government. None the less, the original proposals of the committee became the basis of the regulations adopted for the control of the milling industry, and a considerable measure of discretion as to their enforcement was of necessity lodged in the Milling Division.

The flour milling industry is composed of nearly 7,000 distinct units representing a wide variety of methods in manufacturing and selling, in grinding different kinds of wheat, and in producing at greatly varying costs. Owing to the partial abandonment of the earlier plan of price regulation, it became necessary to mobilize this great industry within a period of ten days, and to induce substantially all the considerable mills to enter the agreement with the Food Administration, so as to give promise of making it effective.

What were the inducements to mills to enter such an agreement? At first sight it might seem that in so doing a mill was surrendering a great deal. The acceptance of the three-year basis of wheat allotment and consequent restriction of business operations, *seemed* to be a sacrifice of individual commercial initiative. However, the circumstance that the Grain Corporation would have practical control of wheat supplies made it imperative that all except remote country mills do their purchasing through the Grain Corporation, if they were to get any wheat at all. On the other hand, there was the positive assurance that under the Grain Corporation's wheat allotment plan the relative position of all the units in the industry, at least in so far as they entered the agreement, would be maintained. Each mill would be entitled to a definite pro rata share in the total flour business. There was also the assurance of an opportunity to share in the export business (and to bid upon government contracts upon a preferred basis).

Considerations of a more dubious kind doubtless had their influence also in bringing wavering millers into the agreement. With the sweeping powers of profit control which could be exercised under the licensing section of the Food Act, it must have been realized that a free rein would not be given to those concerns which elected to remain outside (the agreements). Contrasted with this was the quasi-promise held out by overzealous members of the Milling Division that the twenty-five cents per barrel profit maximum was equivalent to a guaranty of twenty-five cents per barrel net. This was a rate of profit which was tempting indeed, compared with the rates which were normal for the industry.[1]

[1] The Federal Trade Commission's Report on Flour Milling and Jobbing, issued April 4, 1918, showed that for the year 1912–13, the net profit per barrel had been 14 cents, and this yielded a return of over 9 per cent upon the investment; for the year 1913–14, the profit per barrel was 19 cents, yielding a return of about 13 per cent on the

There was the further consideration that the Milling Division would be administered by successful millers, in sympathy with the trade, and themselves having a large stake in the ultimate success of the plan of intra-trade control. Sundry advantages were to be expected also from the various forms of assistance which the Grain Corporation and the Milling Division might render individual millers, through car service bureaus, help in arranging export shipments and sales to the government, and from the intangible, tho important "advertising value" resulting from the exploitation of the fact that the agreement mill was a "member of the Food Administration." A quite different stimulus operating in the same direction was the pressure put upon the trade by the editorial policy of the leading trade journal.

Not least among the considerations leading millers, and grain dealers also, to enter the agreement with the Grain Corporation, was the guaranty by the latter against a decline in the value of wheat or flour below the government price basis. Had the Grain Corporation been obliged to rely upon its own capital of $50,000,000 it could not safely have assumed this great hazard. Arrangements were entered into with the Wheat Export Company, however, backed by the financial resources of the British Treasury, by which the Export Company practically underwrote the purchases of the Grain Corporation. As it was, the latter assumed the function of protecting unsold stocks of wheat or flour against price risks, and thus stepped into the gap which the restriction of future trading had left in normal hedging operations.

As the result of all these factors over three thousand millers, first and last, pledged themselves to operate their businesses in agreement with the Food Adminis-

investment; for the year 1914–15, the rate of profit had been 25 cents per barrel, yielding a return of nearly 16 per cent on the investment; for the year 1915–16, the profit per barrel was 21 cents, yielding a return of about 15 per cent on the investment.

tration. The significance of this lies chiefly in the fact that without such voluntary agreements by the mills to observe the government fair wheat price that whole plan of regulation, both as to wheat prices and flour prices, would have fallen through, for there was nothing in the law to prevent a mill from paying any price for wheat that it chose. In fact many country mills did elect to remain outside, and some of them greatly increased their volume of business by offering the farmers a better price than the agreement mills could offer. Owing to the representations of the Milling Division, however, far the greater part of the flour milling capacity of the country was induced to enter the agreement to abide by the government's fixed wheat price. This immensely simplified the whole problem of regulation. The Milling Division deserves great credit for having accomplished this highly difficult task.

Partly to meet the problems presented by the non-agreement mills and partly to extend the principle of uniformity as widely as possible, the Food Administration decided to license every flour mill having a capacity in excess of 100 barrels daily.[1] Over six thousand mills were licensed, first and last, and practically all the provisions of the voluntary agreement except those relating to the fair wheat price were made applicable to the business of the licensees. Among the more important of the license provisions were those which prohibited the storage of wheat and rye for more than thirty days, limited the rate of profit to twenty-five cents per barrel, and prescribed the minimum rate of flour extraction. In other words, practically the only rule governing flour milling operations which was left as a matter of voluntary agreement was that relating to the maintenance by the agreement mills of the government's fair wheat

[1] Subsequently (January 10, 1918) the size limit was reduced to 75 barrels.

price. With this one large exception, therefore, the effective control of profits and commercial practices by the Food Administration rested upon the powers of license control and not upon the agreement. Owing to the partial abandonment of the earlier plan of price regulation, it became necessary to mobilize this great industry within a period of ten days, and to induce substantially all the considerable mills to enter the agreement with the Food Administration, so as to give promise of making it effective.

VI

With a view to determining a fair price at which the government's wheat purchases should be made, the President announced on August 14, the appointment of a committee of twelve members selected from representatives of the various producing sections and consuming interests of the country. The Food Administration announced in advance its intention "to use every authority given it under the bill and the control of exports to effect the universality of this fair basis throughout the whole of the 1917 harvest year without change or fluctuation," and further declared "if it is necessary for the government to buy the entire wheat harvest in order to maintain this fair price in protection of the producer, we intend to do so." By stabilizing the price of wheat throughout the year the Food Administration hoped to eliminate the hazards of operation of the milling and distributing industries, due to price fluctuations, and to restore the normal margins of profit, so that the price of flour and the price of bread would also be stabilized and presumably be reduced.

On August 30, the Wheat Price Committee made its report to the President recommending the fair price to

be paid by the government for wheat of the 1917 harvest. In reaching its decision the Price Committee had to reconcile the conflicting claims of producer and consumer, bearing in mind the necessity of encouraging the one and yet not discouraging the other. The Committee called attention to the consideration that the government price for the 1917 wheat crop was, in effect, a continuing guaranty until the minimum price guaranteed by Congress for the crop of 1918 should go into effect. The price recommended was $2.20 per bushel, based on No. 1 Northern spring wheat, or its equivalent, with appropriate discounts for lower grades, delivered at Chicago. The Grain Corporation had already established a schedule of differentials to govern the different grades, and relative prices at the different terminal markets. In announcing to the press the report of the Wheat Price Committee the President authorized a statement reading in part as follows:

> It is the hope and expectation of the Food Administration, and my own also, that this step will at once stabilize and keep within moderate bounds the price of wheat for all transactions throughout the present crop year, and in consequence the prices of flour and bread also. The Food Act has given large powers for the control of storage and exchange operations, and these powers will be fully exercised. An inevitable consequence will be that financial dealings cannot follow their usual course. Whatever the advantages and disadvantages of the ordinary machinery of trade, it cannot function well under such disturbed and abnormal conditions as now exist. In its place the Food Administration now fixes for its purchases a fair price, as recommended unanimously by a committee representative of all interests and all sections, and believes that thereby it will eliminate speculation, make possible the conduct of every operation in the full light of day, maintain the publicly stated price for all, and, through economies made possible by stabilization and control, better the position of consumers also.

VII

When the Grain Corporation began active operations early in September it found itself confronted by a set of peculiarly difficult problems. Not least among these was the hostile attitude of many wheat growers which arose from widespread resentment against the policy of fixed price control. This resentment was reflected in unwillingness to sell at the established price basis. Kansas and Dakota farmers, as well as those of the Pacific Northwest, began an agitation for an increased price. The wheat market was in a state of chaos, with the ordinary machinery of the grain trade almost entirely dislocated, and the normal milling production of the country so greatly reduced that there was a dangerously low level of flour reserves as well as a shortage of wheat at the terminals. In spite of the extremely small carry-over from the short crop of 1916 — less than one month's needs for domestic consumption — over ten million bushels of wheat and nearly two million barrels of flour were exported in July and August.

VIII

Obviously the first need was to stimulate the idle milling capacity of the country to renewed activity and to restore the flour reserves to the safety mark as quickly as possible. With this end in view the area of the United States was divided into fourteen zones centering about the leading terminal grain markets, and in these fourteen cities and in four " sub-terminal " markets buying agencies were established, each under the direction of a leading member of the grain trade, who gave his services without remuneration and who was required to dissociate himself absolutely from his business interests in

the grain trade. These government buyers were entrusted with the responsibility of administering the Grain Corporation in their respective zones. A large measure of local autonomy was granted to each zone agent as to the methods he should adopt in meeting the particular problems sure to arise in his own district, but in general the scheme followed was that the Grain Corporation replaced the elevator and warehouse men and grain dealers at the terminals as intermediaries between the country shippers of wheat, whether elevators or farmers on the one hand, and the flour miller and exporters on the other. The prohibition against storage of wheat and rye for more than thirty days, which was made applicable to grain dealers as well as to mills, practically put out of business this whole group of middlemen at the terminal markets, so far as trading in these grains was concerned. Further, the practice of mixing wheat of different grades was absolutely prohibited during the season of 1917–18. The large terminal elevators, which normally carry enormous quantities of wheat through the winter weather, and many of which earn large revenues from mixing wheat of varying grades, enjoyed very little business in wheat under this arrangement. In those markets where grain is ordinarily consigned by county shippers to commission merchants and by them sold to millers or other buyers, the modification of the method of doing business previously in vogue consisted chiefly in requiring all dealers who had wheat for sale at the terminal markets to report their receipts each day to the Grain Corporation zone agent, who then apportioned the available supplies to the mills at the government fair price plus an administration fee of one per cent to cover costs of operation. The Grain Corporation itself bought as little wheat as was necessary to promote the rapid distribution of grain

to the mills and to export agencies, and then only as unloaded in elevators at terminal points. It did not buy at all from farmers or original shippers and discouraged direct consignments on which it collected a one per cent commission charge on account of the administrative labor involved.[1]

Of necessity, government control of the wheat business operated greatly to restrict the field of individual enterprise. In view of this fact and of the consequent hardship imposed upon many elements of the trade, the practically unanimous endorsement of the policies and plans of the Grain Corporation by a representative body of terminal elevator and grain dealers assembled at Washington, August 15, 1917, and also by a body of seven hundred terminal and country dealers in convention at Buffalo, September 24, 1917, must be taken as a striking testimonial to the fairness of the Grain Corporation's methods of operation and as convincing evidence of appreciation by the trade of the necessity of government control.

The mode of allotment of wheat to mills within a given zone, and to "outside" mills drawing upon a particular market, was based upon a proportional arrangement determined by averaging the grind of each mill making requisition for wheat in the zone for the three years 1914, 1915, 1916, and alloting to each a percentage of the available wheat equal to the percentage which its average grind for the three years specified was of the total grind for all the mills during the same period,

[1] In the purchase of wheat the Food Administration acts purely in a merchant capacity, buying wheat at the interior terminals, and reselling on the one hand to the millers for domestic consumption and on the other hand for export purposes. To make sure that its operations will be conducted without loss, the Food Administration has secured assurances from the Allies that they will purchase at the "fair price" all wheat delivered at the seaboard and placed at their disposal. To cover its cost of operation the Food Administration adds one per cent to the cost of wheat at the interior terminals when it sells (to millers or to exporters). United States Food Administration: Policies and Plan of Operation; Wheat, Flour and Bread. December 1, 1917, p. 32.

due allowance being made for new capacity. By their agreement with the Grain Corporation the mills pledged themselves to do their buying through its agencies and not independently, except where buying directly from farmers and local dealers at country points. Grain shippers at country points were required to advise the zone agents in advance of their wheat available for shipment. More than two-thirds of the 20,000 country elevators entered into an agreement with the Grain Corporation by the terms of which the latter, upon payment of storage and carrying charges at the rate of two cents per bushel per month and guaranty to the elevator operators against a decline in the price of their wheat below the government basis, secured the right to control the disposition of the elevators' stocks of wheat, either as to retention at point of origin or, upon adjustment of returns, diversion of shipment from the destination originally intended. By this control of country shipments, by eliminating to a considerable degree the buying of the terminal elevators, and by strict attention to details of traffic reënforced by efficient car supply departments maintained for the aid of grain and flour shippers, the Grain Corporation was able to take the wheat from point of origin and to deliver it to the mills with but very little delay and burden of transportation and handling costs. During the first three months of operation by the Grain Corporation the receipts of wheat at the primary markets ran nearly 100,000,000 bushels behind the figures for the corresponding months of 1916 — a decline of nearly 60 per cent — but the rate of flour production during the same period was over 15 per cent larger than during the corresponding period for the previous year, notwithstanding the fact that in 1917 the total available stock of wheat was over 15 per cent less than the 1916 stock. For the entire crop year, from

July 1, 1917, to June 30, 1918, the aggregate receipts and shipments of wheat at the eleven principal interior markets and the seven chief export points were less than half the corresponding figures for the previous year. The output of flour, on the other hand, was, as nearly as can be calculated, almost exactly the same in the two periods — namely, slightly over 100,000,000 barrels in each year.[1]

In order to secure an equitable distribution of the available wheat stocks among the mills of the several milling divisions it was necessary for the Grain Corporation to rearrange existing supplies by diverting local surpluses as far as possible from regions of excess to regions of deficit and to fill in the gaps by the importation of supplementary supplies from outside sources. A policy agreed upon with the Allies of treating the North American crop largely as a whole enabled the Grain Corporation to draw upon the movement of the Canadian surplus via the Great Lakes to the extent of about 24,000,000 bushels during the year 1917–18. About 4,000,000 additional bushels of wheat were imported from Australia, chiefly in small sailing vessels. Nearly 700,000 barrels of flour were also imported from these two sources.

IX

The achievements of the Grain Corporation in distributing the existing wheat stocks so as to prevent local scarcity and avoid waste and in conserving every bushel possible for the needs of the Allies, were accomplished in spite of serious car shortages and port congestion. In one important wheat growing region the transportation

[1] There are scarcely any reliable statistics on the aggregate flour production of the United States except those supplied by the U. S. Census of Manufactures at five-year intervals. I have followed the estimates of the Statistical Division Information Service of the Food Administration.

situation was actually improved by the action of the Shipping Board in providing tonnage for the movement of flour from the Pacific Coast to Atlantic ports and for export, and in another by the action of the Grain Corporation itself in reorganizing the wheat movement on the Great Lakes.

With the progress of the war and the shrinkage of shipping available to carry wheat from the North Pacific coast to its usual export destination, an extra burden had been thrown upon the transcontinental railroads to move wheat from this section to the eastern milling and consuming centers and to the Atlantic and Gulf ports for foreign shipment. The Pacific coast mills had also begun to build up a very large flour business in the southeastern states, where the product of the soft starchy wheats of Washington and Oregon was in high favor. The freight rates on these transcontinental shipments on both wheat and flour were very high and the establishment of a fixed wheat price based upon Chicago made the returns to the Pacific coast wheat growers relatively low. The organization of the grain trade in this section differs from that which prevails typically in other parts of the country in several essentials. Grain is harvested and handled largely in sacks instead of in bulk, and is stored in that form in flat warehouses instead of in elevators equipped with machinery. Because of that condition and also because of the peculiar climatic conditions of the principal wheat growing districts of the Pacific Northwest, the crop is marketed in a different manner and leaves the farm more cleanly in the early months of the crop year than in other sections of the country.

Now the calculation of the Pacific coast wheat price on the basis of the Chicago price for equivalent grades less freight and other shipping charges introduced no

new element into the situation; it merely affirmed a condition which had existed for practically two years. None the less complaint at once arose on the part of the Pacific coast wheat growers and handlers against putting them on the basis of Chicago price, less freight. With the prospect of ocean transportation available owing to the construction of new ships at Pacific yards it became possible to establish a base price at North Pacific export points on an overseas basis instead of adhering to the former price based on rail transport to Chicago. Therefore, having got assurance from the Shipping Board of fairly reasonable water rates, the Food Administration on September 22 established a base price at Portland and Puget Sound ports for No. 1 Northern, or equivalent, at $2.05 per bushel for bulk wheat with the usual premium for wheat in sacks. This meant an increase in the price to the grower in eastern Washington and Oregon of approximately fifteen cents per bushel over the price based on Chicago. A very large wheat crop in those states which would otherwise have seriously hardened the rail carriers was largely retained on the Pacific coast for grinding by the local mills and the product shipped by water instead of by the usual rail route overland.

The other critical transportation problem, aside from chronic car shortage, was presented by the conditions on the Great Lakes, where the available carriers had been seriously depleted by the action of the Shipping Board in transferring to the Atlantic such vessels as were suitable for use on the ocean. Lake facilities for grain shipment promised to be inadequate for the urgent ore movement plus the also urgent coal movement, plus the grain and flour movement. Grain shipments during the fall, at least from the Canadian Northwest, might be expected to be very large. To protect the large mills at

the eastern end of Lake Erie, as well as to keep a stream of wheat flowing to New York, the Grain Corporation made an agreement with the Lake Carriers Association operating American steamers and with the Canadian Association controlling Canadian steamers, by which they guaranteed to furnish at a maximum rate of 4½ cents per bushel, basis Duluth to Buffalo, all the carriers which the grain trade would require. In return for this the control of the grain trade on the Lakes was to be put entirely in the hands of the Grain Corporation agent at Buffalo as to the placing of boats for discharge at the elevators available there, so that boats should not be required to wait their turn behind particular elevators. The result was that for the first time in twenty years there were no blockades at the eastern end of the Lakes and a much larger use of the Lake facilities was therefore made possible. In fact the full ore movement was handled and the full amount of coal stocks at the northwest was transported during the season of open navigation, while in addition the entire grain movement was handled — all by a lake fleet which had promised to be inadequate.

X

The Grain Corporation did not deal directly with the farmers, since it confined its wheat purchases to the stocks held in elevators and warehouses and to the daily arrivals at the terminal markets. None the less, the attitude of the farmers towards the fixed wheat price was an important factor in the practical operation of getting the wheat to the mills.

The theory of the stabilized price was that it relieved the growers of the burden of marketing wheat at the expense of necessary farm work for fear of a decline in the price, and also, by removing the expectation of a

higher price later in the year, would promote a more even marketing of the crop through the year. The event justified this expectation of the Food Administration only in part. During July and August, while Congress was discussing the Food Bill and before the Grain Corporation entered the field and the Wheat Price Committee had reached its decision on a fair price — a period which offered unusual hazards to buyers, millers, and handlers, as well as leaving the farmer in doubt as to the final price outcome — the farm marketings of wheat were, as nearly as can be ascertained, 88,000,000 bushels;[1] whereas for the ten weeks from July 1 the theoretical average as computed by the Department of Agriculture for farm marketings for a crop of this size should have been 144,000,000 bushels; the actual marketings were apparently 56,000,000 bushels behind the normal for the crop.

The failure of Congress to pass the Food Bill, as the President had urged, in time to permit the controlling agencies of the Food Administration to be organized by July 1, in order to be ready when the new crop should begin coming on the market, had delayed the beginning of operations by the Grain Corporation until early in September. Over two months had elapsed during which the winter wheat movement was already under way, marked by a price fluctuation of fifty cents per bushel. When at last the stabilized price went into effect, many grain dealers faced a loss on the wheat they had bought. Many farmers were discontented because they could not sell their entire crop at the high prices made by the uncontrolled influences which had dominated when the previous year's crop had been exhausted and the market was without any balance wheel. The crop was slow to move. During the greater part of September the

[1] Estimated from weekly reports to the Food Administration Grain Corporation.

farmers in the principal grain growing sections were apparently unwilling to sell much wheat; especially was this true in the Northwest, where under the stimulus of exceptionally high prices the record-breaking oats crop was being rushed to market. There was also a large corn crop to take care of and corn prices were establishing new high records. The farmer, in consequence of being relieved from the fear of a falling wheat price which in former years had stimulated him to dispose of his crop in the harvest rush, sometimes even to the neglect of necessary farm work, was enabled to take advantage of the unusually favorable weather conditions for fall plowing and seeding. Unquestionably the stabilized wheat price was a factor in forwarding the condition of farm work, which had almost never before been as well advanced as in the fall of 1917; especially in the spring wheat states fall plowing was of unusual extent.

All these influences made for a lighter movement of wheat than the normal crop rush. Nevertheless, the total farm marketings from September 6, when the Grain Corporation commenced business with its stabilized price, up to December 29, were 315,000,000 bushels,[1] against a normal computed average of 270,000,000 bushels for this period. In seventeen weeks, under the Food Administration's fixed price plan, farm marketings had been so enlarged as practically to overcome the deficit below the normal rate for the first two months of the crop year.

A source of constant irritation among the farmers during the 1917–18 season was the interposition of the new Federal wheat standards and Federal supervision of grading and inspection at the primary markets. After ten years of agitation, largely by the representatives of the farming interests, Congress had at last enacted the

[1] Reports to Food Administration Grain Corporation.

requisite legislation, and the Department of Agriculture promulgated uniform wheat standards which were made mandatory upon the grading of all grain moving in interstate commerce. These new grades prescribed rigid standards for moisture content and uniformity of quality, and had the effect of penalizing sharply grain which contained inseparable impurities or which otherwise was below standard. They were injected into the situation at the very beginning of the crop movement for 1917. The unsettlement of the established trade could scarcely have been emphasized more sharply by any other combination than that of a government stabilized price and a government standardized grade replacing the former standard and the former methods. The rigidity of the new system was emphasized by the fixed price differentials between the several grades which the Grain Corporation had found necessary to establish in order to maintain the stabilized price with uniformity and definiteness. Many country dealers, unfamiliar with terminal grading under the Federal standards, in order to make themselves safe, were unduly rigid in the grading of country deliveries. Naturally this gave rise to much complaint under a fixed price system. Gradually these inequalities were smoothed out, and the Food Administration in many cases required the country dealers, under pain of forfeiture of their licenses, to make restitution to the farmers where they had been too severe in their interpretation of grades and dockage. In order to secure the farmers the full value of their grain through competition the Grain Corporation left as wide a field as possible for the purchase of wheat by sample; all grades below No. 3 were bought on the basis of actual worth and not on the basis of fixed price differentials.

XI

The tendency for growers to hold back their wheat for an advance in the market or what they consider an "advance," offers material for an interesting study in popular psychology. The farmer had always hitherto been accustomed to an unhampered market and he continued to look for an unhampered market. The idea that the price would advance through the season was normal with him; it was difficult for him to realize that a stabilized price system would not permit such an advance. The idea of an advancing price dies hard. The reasons are, perhaps, not far to seek; the farmer is close to the growing crop; he sees it being winter killed, or damaged by rust, insect pests, or bad weather, and he reasons that the price *must* advance because of the shrinking supply. Half a year of price stability was too short a period to accustom the farmer to the idea of an unvarying price for his product or to induce him to market it freely. It was an easy transition for him to look to Congress for an increased price.

During January, 1918, severe winter weather and lack of car supply slowed up the farm marketings of wheat; this slowing up was soon to be intensified by a new influence. In January, Congress began an ill-advised agitation for an increase in the guaranteed wheat price for the crop of 1918.[1] The result upon the crop movement was at once apparent: farm marketings for

[1] AGRICULTURAL APPROPRIATION BILL — H. R. — 0054

Reported in House	Jan. 21, 1918
Passed House	Feb. 1, 1918
Referred to S. Com. on Agriculture and Forestry	Feb. 4, 1918
Reported back with amendments	Feb. 11, 1918
Passed Senate	Mar. 21, 1918
Sent to conference	Apr. 1, 1918
Conference report agreed upon	July 6, 1918
Vetoed	July 12, 1918

the season (from July 1) which had been practically even with the average on December 29, had by April 6, fallen over 30,000,000 bushels below the normal for a crop of this size.[1] In spite of the car shortage and bad weather, the farm marketings of corn, oats, and barley, the prices of which were uncontrolled, ran heavily above the seasonal average during the most of the winter period.[2]

The agitation in Congress for an increased wheat price took the form of an amendment to the Agricultural Appropriation Bill for the fiscal year 1918–19. Several amendments were offered, but the one which ultimately prevailed in Congress, and which may be taken as typical, proposed a basis minimum guaranteed price for the 1918 harvest of $2.50 per bushel for No. 2 wheat (the most common grade) at country stations, as compared with the government fair price of $2.20 for No. 1, Chicago basis, for 1917–18. The Senate voted in favor of an amendment in about this form some time during April. To forestall Congressional action and thus anticipate events which might hamper the Food Administration in its task of getting the 1917 crop marketed, President Wilson, under authority conferred by Section 14 of the Food Act, issued an executive order on February 21, 1918, establishing the government guaranteed price for the crop of 1918 on the same basis as the government fair price for 1917–18, namely, $2.20 per bushel for No. 1 Chicago, with appropriate premiums and discounts for other markets and other grades.

Congress was insistent, however, and the Senate conferees succeeded in inducing their House colleagues to agree upon an amendment guaranteeing a uniform minimum price at *all* country stations, irrespective of

[1] Reports to Food Administration Grain Corporation. [2] Ibid.

location or distance from terminals, of $2.40 per bushel for No. 2 wheat of the crop of 1918. The Agricultural Appropriation Bill containing this amendment was passed by Congress on July 6. It was vetoed by the President.

A general 25 per cent advance in freight rates by the Railroad Administration necessitated a readjustment in the government's buying basis for the new year however. Under authority contained in an executive order of June 24th the Grain Corporation increased the prices at terminals, as announced February 21, so as to establish a minimum of $2.00 per bushel for wheat loaded upon railroad cars at country stations in the least advantageously located points in the country, with correspondingly higher prices for places less remote from market. However this is a matter beyond the scope of the present paper.

XII

Proceeding now to a consideration of the problems of the milling industry under Food Administration control, let it be recalled that the abnormal conditions which prevailed in the spring and summer of 1917 had resulted in something approaching a trade deadlock. So long as the government fair wheat price remained undetermined most mills were unwilling to buy freely and confined themselves to comparatively limited operations. During July and August the rate of milling activity for the whole country was less than 75 per cent of the normal for that season.[1] But when the government wheat price was announced, August 30, the mills entered the buying market and as soon as wheat

[1] Even in September some of the large Minneapolis mills were forced to shut down for lack of wheat.

began to move freely from the farms milling activity was resumed. A very large flour output was secured during the last four months of 1917, record figures being established for part of that period.

XIII

The result was that flour prices were greatly reduced and the gaps in the commercial stocks filled up. The agreement mills were able to absorb most of the wheat offerings at the government fair price. The limitation of profits to twenty-five cents per barrel, reënforced by the declaration of the Food Administration that profits in excess of that figure for the year's business would be deemed unreasonable, had the effect of keeping flour prices in most parts of the country approximately on the basis of the government price of wheat. During the period of vicious speculation of the spring and summer of 1917, before the regulation of the Food Administration became effective, flour prices had ranged from $12.00 to $16.00 a barrel at the mill door. Under the régime of control wholesale flour prices were reduced to from $10.00 to $11.00 a barrel for most mills. This was an achievement of the first importance, and, whatever the offsets and inadequacies, is sufficient to justify the work of the Food Administration and the Milling Division.

This method of price regulation, however, based upon cost of production plus a stipulated margin of profit per unit of output — a margin which soon came to be interpreted as a minimum rather than a maximum — was clearly open to objections. It did not promote efficiency of operation; it offered dishonest and unpatriotic millers opportunity and temptation to pad their reported costs. The original suggestion of an operating

differential, to include cost as well as profit, limiting the cost figure to seventy-five cents per barrel,[1] had been dropped because of the extraordinary range of costs within the industry, embracing concerns from the largest to the smallest. The profit regulation as adopted was a simple expedient of a rough and ready kind designed to meet the necessities of the situation. It was, perhaps, the only method of regulation which offered a fair chance of success. Tho surprisingly effective in the main, it led, none the less, to serious difficulties.

XIV

Some unexpected circumstances rendered the problems of regulation more complicated than had been expected. Fundamental to the entire situation was the fact that the wheat crop of 1917 was the smallest in years, smaller even than had been estimated in August when the Food Administration announced its policies of control. One effect of such a short crop was to abridge still further the scanty range of competition which the regulation had left undisturbed. The crops of England and France were also much smaller than had been expected and the gravity of the export problem was correspondingly increased. With added pressure resulting from the need of prompt flour shipments abroad it became necessary to stimulate milling activity to as rapid a rate as possible. The Food Administration had originally hoped that it would be possible to operate the mills at a fairly even rate of production through the year, but in fact a very large part of the flour production of the mill year — something like 52 per cent — had to be crowded into the four months, September, October, November, December.[2] Yet throughout this period

[1] See page 47.

[2] From estimates by U. S. Food Administration, Milling Division.

domestic buying demand was insistent and far exceeded the capacity of the mills to keep pace with it.

A marked reduction in operating costs resulted from this high rate of milling activity. A peculiar consequence was that many mills found it difficult, almost impossible, to reduce their prices for flour and feed rapidly enough to keep their profit margins within the allowable maxima — twenty-five cents per barrel on flour and fifty cents per ton on feed. Flour prices, tho tending downward, did not at once fall to a basis strictly commensurate with the lowered wheat price established by the Wheat Price Committee. Wheat feed prices, especially, failed to recede; indeed they tended to advance, reflecting the high prices then current for feeding stuffs generally. Corn, oats, and cotton seed cake and meal ruled at very high prices towards the end of 1917 for various reasons. The question arose whether it would be wise to attempt to force down the price of mill feed in view of the high prices of competing feedstuffs and the scanty supply of mill feed resulting from the short wheat crop. Of course, any reduction in feed prices would tend, *pro tanto*, to increase flour prices. After much deliberation it was finally decided to issue rules (promulgated by the Milling Division, December 18, 1917) fixing maximum prices for mill feeds. These prices were to be calculated by each mill and were based definitely upon the cost of wheat at the mill door; the maximum wholesale price per ton for bran, in car lots bulk at mill, was set at 38 per cent of the average cost to the mill of a ton of wheat, as calculated from the prices paid during the previous month; fixed differentials based on the bran price were established for the other mill feeds.

This attempt to control feed prices proved largely abortive. To begin with, the Milling Division specifi-

cally exempted outstanding feed contracts from the operation of the rule, which therefore did not become effective as to prohibition upon shipments at the old prices until a period of time had elapsed (from two to six months, as it proved) sufficient for the mills to complete the fulfillment of existing contracts. No adequate reason has been given, nor is any forthcoming, why outstanding feed contracts should have been exempted from the operation of the rule as promulgated; especially since on the very same day a rule was announced which required the cancellation of a very considerable proportion of the outstanding flour contracts. In the second place, the 38 per cent rule referred only to bulk prices in car lots, whereas many mills did a considerable feed jobbing and even retail business, especially those in the country districts. Higher prices were charged for feed sold on a jobbing or retail basis and the permissable margins for this type of service were very inexactly defined or understood. The addition of the cost of sacks increased the average price of feed by four or five dollars a ton. Again, very little attempt was made to control the activities of the feed jobbers; in the nature of the case it was difficult to bring them under effective regulation. The Milling Division regarded them as beyond its province and the other regulating agencies of the Food Administration, with the exception of the state Food Administrators, were slow to develop the machinery of control. In the face of the blighted corn crop of 1917 and the almost complete breakdown in railroad service, feed dealers could get almost any prices they asked during the winter of 1917–18. Consequently complaint of "profiteering" was very general, especially in the wheat growing regions, where the farmers felt aggrieved because, while the price of wheat had been reduced from the high quotations prevailing dur-

ing the summer of 1917 by the action of the Food Administration, mill feed prices had remained high and in many cases had increased, even after the issue of the 38 per cent rule. There was also complaint on the part of those mills which did keep within the 38 per cent rule against those which did not; western feed was frequently selling in eastern markets at higher prices than the superior local product. It was not until towards the end of the winter that the Food Administration took any adequate action to restrain profiteering in feeds. The Enforcement Division (presently to be described) was able to do some effective work, especially in the Southwest, where conditions had been particularly bad, and considerable improvement was brought about through coöperative action by millers, jobbers, state Food Administrators and other interested parties. The difficulties of the situation were admittedly very great, but on the whole the Food Administration cannot be credited with conspicuous success in its handling of the mill feed problem.

XV

Coincidently with the issue of the 38 per cent feed price rule, the Milling Division promulgated a new rule governing the ratio of extraction of flour and feed. The September and October reports of the agreement mills had shown a prodigal use of wheat per barrel of flour produced; too much feed and too little flour were being made from a given amount of wheat. The reason was that the mills were making a relatively large proportion of expensive " high patent " flours which yield a large amount of offal as compared with the cheaper grades of " straight " flour. By the new rule the amount of wheat that might be used in making a barrel (196 pounds) of flour was reduced from a maximum of 285

pounds for the better grades, as originally established,[1] to a maximum of 264 pounds for the same grades, with appropriate differentials for the lower grades — a rate of flour extraction equivalent to 74 per cent. This was avowedly a measure for conservation; the original maximum of 285 pounds, adopted in August, was, perhaps, the best that could have been fixed at the time. The great variation in character of mechanical equipment and milling skill between different mills made it impossible to insist at the outset upon more rigid standards of extraction. But the Milling Division had in the meantime systematically urged and taught the backward mills, by appropriate descriptive matter, blue prints, and the like, and through a staff of mechanical experts, so to improve their standards that the effectiveness of the entire industry was brought measurably up towards the best practice — another notable achievement. It was only with the progressive improvement in mechanical equipment, which was thus stimulated, and the increasing realization by the millers generally of the need of regulation and their increasing willingness to coöperate, that the 264 pound rate became possible. Under this regulation the amount of wheat used per barrel of flour was greatly reduced.

Of greater significance, perhaps, than the increased rate of extraction was the prohibition imposed by this same rule upon the separation of flour into several grades — patents, clears, straights, etc. After the effective date of the rule (December 25, 1917) not more than 5 per cent of " low grade " might be removed from the flour as ground; the remaining 95 per cent had to be sold as a uniform " straight " flour.[2] Of course, this

[1] See page 10.

[2] This was one of the measures which Mr. Hoover had advocated from the first; the other was the establishment of a fixed operating differential to include millers' costs and profits.

played havoc with established brands, since the product of all mills was now placed upon a basis of uniformity, except, of course, as they used different kinds of wheat and could command varying grades of milling skill. However, it immensely simplified the problem of price regulation, since a standard flour now replaced the multiplicity of grades and brands which had formerly baffled attempts at direct price control.[1] Thus the way was passed for the next forward step in the technique of food administration in the milling industry.

XVI

This was not to come at once, however. Further experience was necessary under the "cost plus" method of price regulation, and to this we must now give attention.

Towards the end of 1917, many mills found themselves in possession of profits considerably in excess of the allowable maximum of twenty-five cents per barrel. Some had already even exceeded this rate on their entire accountable allotment for the entire season. This situation raised the question of the proper interpretation of the profits rule. Did twenty-five cents per barrel maximum profit mean twenty-five cents per barrel in each month, or twenty-five cents per barrel figured on the whole season's operations? At the outset the Food Administration took the view that if in any one month the profits of an individual mill were in excess of twenty-five cents per barrel, its selling price should be forthwith reduced so as to bring its current profits within the twenty-five-cent maximum; profits in excess of this figure were not to be accumulated in the earlier months

[1] Subsequently (about March 1, 1918) even the separation of the 5 per cent of low grade was prohibited. Thereafter all flour made was required to be 100 per cent straight flour.

against decreased profits or possible losses expected to occur in subsequent months. However, the concentration of the period of maximum grinding within the first four or five months of Food Administration control indicated that profits would perhaps be very meager in the lean months to come.[1] In other words the milling industry, always a seasonal business, was unusually compressed during this year. So great, moreover, was the variation in rate of milling activity and, therefore in costs and profits, from month to month for individual mills, that the Food Administration was forced to the conclusion that the profit limitation could not be applied strictly to each individual month or to any short period. Meanwhile the position was being strengthened of those who maintained that the limitation of profits to twenty-five cents per barrel was equivalent to a virtual guarantee of twenty-five cents per barrel as a minimum return.

XVII

Any method of regulating the price of flour upon the basis of cost plus stipulated or maximum profit is predicated upon a thoro audit of millers' costs. Partly to perform this function and partly for other reasons, the Milling Division established at its headquarters in New York an auditing department. The task, obviously, was a large and difficult one. The duties of the department were confined at first to checking the monthly cost reports, at the New York office, as regards clerical correspondencies and discrepancies. Its energies were also devoted in part to working out a system of flour mill accounting designed primarily for the use of small mills and recommending its adoption by the

[1] Over 60 per cent of the total flour output of the United States for the season July 1, 1917, to June 30, 1918, was produced in the five months, September, October, November, December, January.

trade (an important reform measure, it may be added), and to exercising a general supervision over the reporting mills by correspondence. This was useful work and accomplished some positive results. Little or no actual field work or effective check on loose or dishonest practices was attempted, however. The Milling Division took the view that it was not its business to police the industry and that to discipline millers or attempt anything of the sort would perhaps defeat that spirit of voluntary coöperation which it was anxious to develop. It declined to avail itself of the facilities for independent auditing offered by the Federal Trade Commission. Towards the end of the winter the various divisional offices of the Milling Division, one in each of the nine milling centers of the United States, employed a limited number of inspectors and accountants to visit the mills, check their yields, and assist them in their accounting problems.

Not a few millers took advantage of the situation and loaded their cost reports with improper items. Some came to believe that they would never be investigated or molested if they should pad their cost reports. Such items as new construction and equipment, largely increased salaries to officers (in some cases made retroactive to include a fiscal period closed before the beginning of Food Administration control), bad debts of ancient standing, excessive depreciation charges, losses on miscellaneous outside investments, etc., were added to current costs of production and so charged to the consuming public. Under the conditions of demand which then existed prices inflated in this way could easily be obtained for the flour; in fact, flour could be sold for almost any price, limited only by the flexibility of the seller's conscience.

XVIII

A not infrequent method of evading the spirit of the agreement was that of setting up a "jobbing department," selling the whole output of the mill or a large part of it to the jobbing department at a profit within the twenty-five cents per barrel rule, and then getting all the additional profit possible from so-called jobbing operations, limited only by the more liberal jobbing regulations, which authorized profit margins varying from twenty-five cents to seventy-five cents per barrel, according to the nature of the service performed. Out of some 1500 mills reporting their costs to the Food Administration under the voluntary agreement 439 had separate jobbing departments on June 18, 1918. In many cases these jobbing departments were new creations, designed to cover up profits in excess of the allowable maximum. It was an undoubted weakness in the rules which permitted and perhaps even suggested the creation of these bogus jobbing departments.

On the other hand it must be recognized that many mills which had regularly done some jobbing and retailing did not take advantage of the permission to segregate their jobbing business from their merchant milling operations. Indeed, it had even been hoped and expected that the larger mills which had segregated their jobbing business in the past would, for Food Administration purposes, consolidate their manufacturing and selling costs under a single return and not take a jobbing profit in addition to their milling profit. A maximum profit of twenty-five cents per barrel was considered ample return upon the entire business of such concerns — jobbing and merchant milling combined. Many of the very large mills did, in fact, consolidate their milling

and jobbing returns, especially the Minneapolis mills which operate extensive distributing warehouses. Not so many mills agreed to handle their business in this manner, however, as had been hoped.

XIX

The effective control of this and other kinds of abuses was hindered by some shifting of jurisdiction between the Food Administration offices at Washington and the Milling Division headquarters at New York, and perhaps by the fact that the Milling Division itself was administered by millers engaged in active business operations and having the point of view of private interest rather than that of the unfettered public official. In November, 1917, the Food Administration established an Enforcement Division at Washington whose duty was to see that the regulations of the Food Administration were enforced. The difficulties of this task were admittedly very great; the inspection of the millers' monthly cost reports was for some time confined to a mere statistical examination and audit, without serious inquiry into the underlying facts. In this matter, as in all the problems of regulation, the nature of the task became apparent only with experience; the best mode of dealing with the situation could only be developed gradually.

In February the activities of the Enforcement Division were extended to the flour milling and flour jobbing regulations. A widespread inquiry was made as to the methods followed by the millers in the preparation of their monthly cost reports and many cases of irregularity and some of fraud were detected. Largely as a result of these investigations a marked reform was brought about: the millers in general responded will-

ingly to the new and more careful methods of regulation initiated by the Enforcement Division. For the purpose of getting comprehensive and fairly detailed information all mills of a daily capacity of 75 barrels and over were required to submit a consolidated statement covering the operations of the first seven months of operations under Food Administration control—September, 1917, to March, 1918. This was followed by a similar consolidated report on the three months, April, May, June, 1918—thus completing the portion of the season's business for 1917–18 coming within the period of control. These statements followed closely the general form of the original monthly cost reports, with the addition of a certain amount of itemization deemed essential, e. g., under the captions: milling expense, selling expense, general expense, reserves, jobbing business, etc. At the same time definite instructions [1] were issued designed to clarify the whole accounting problem and indicating the basis of profit determination to be followed in the settlement of the year's accounts between the millers and the Food Administration. Millers were permitted to correct in the consolidated statements errors and misstatements which had appeared in the earlier monthly reports, without prejudice.

Those mills, relatively a small per cent of the total number, whose reports indicated that their profits on the season's business had been in excess of the maximum allowable rate of twenty-five cents per barrel, were required to give up their excess gains, either by the sale of flour, to the government at a nominal price, or by setting up an equivalent credit to the government's purchasing agencies on their books. The Enforcement Division also undertook a thoro-going audit of the accounts of many of the larger mills; a considerable

[1] Milling Division Circular No. 1310, May 15, 1918.

number of mills, on their own initiative, called in the services of auditors and chartered accountants in the preparation of the consolidated statements. The opportunity to remodel their statements was availed of in good faith in most cases, and served to bring about a general conformity to the spirit of the regulations without resort to stringent measures. The number of cases of positive deception or deliberate profiteering proved, in the end, to be relatively small.

XX

One of the most troublesome questions in the whole problem of profit regulation and one which occasioned a great deal of discussion and much misunderstanding concerned the method of handling the items of income tax and excess profits tax in the millers' monthly cost reports. Through the representations of overzealous members of the Milling Division in August and September, 1917, many mills were induced to enter the voluntary agreement with the understanding that the profit limitation of twenty-five cents per barrel meant that they would be permitted to make twenty-five cents per barrel net after all deductions, including taxes. In November the Food Administration through the Milling Division issued a positive declaration to the contrary, so far at least as the excess profits tax was concerned. None the less the idea of a net divisible profit of twenty-five cents per barrel persisted and many mills, including some of the largest, charged in their monthly cost reports as expense items against current costs of production reserves set up in anticipation of excess profits tax payments.

The act by which the excess profits tax was imposed was enacted on October 3, 1917, very shortly after the

milling regulations had been instituted. Few persons were at once aware of the significance and importance of this tax. Altho the earlier act of March, 1917, contained an excess profits tax, that in the later law was much more far-reaching. It was inevitable that adjustment to it should be difficult and that unexpected problems should arise.

Under the legislation of October, 1917, the procedure as to allowing excess profits taxes and income taxes also to be charged against cost of production in the accounts of mills would seem, as a matter of principle, to be clear. Excess profits and income taxes are to be regarded not as items of expense — not as charges which are expected to be passed on to the consumer — but as taxes to be paid out of the earnings and incomes of those on whom they are directly levied. In other words, all such taxes should come out of income and should operate as deductions from income. The Food Administration, even tho it limited the profits of millers to a maximum of twenty-five cents per barrel, in consistency was obliged to hold that the profits were taxable like other producers' net earnings.

Nevertheless, there were unexpected and unequal results from the application of this principle, especially as regards the taxes on excess profits. They ensued more particularly from the circumstance that the taxable year for which the mills made their tax returns were not uniform. Many mills made returns for the calendar year 1917; some for a fiscal year running from July 1, 1917, to June 30, 1918; others for a fiscal year from September 1, 1917, to August 31, 1918, and so on. A mill which made its return for the calendar year might easily be in a position — and this happened for a considerable number — in which the whole of its net earnings after September 10, 1917, became subject to a tax

of 60 per cent. This high rate of tax became applicable if during the earlier part of the year, before September 10, its profits had been over 33⅓ per cent upon its invested capital; since under the provision of the Act of October 3, 1917, all earnings in excess of 33⅓ per cent on capital became subject to a tax of 60 per cent. Many mills had made such large profits during the earlier part of the year that their ensuing profits became taxable at this high rate. At the same time, during the period after September 10, 1917, the profits of the mill(s) were restricted, being subject to the regulation by which they were not to exceed twenty-five cents per barrel, and it was these " restricted " profits that became taxable at the 60 per cent rate. As compared with a mill in this position, another whose taxable year was not the calendar year, but ended on June 30, 1918, or August 31, 1918, might be taxed lightly upon its profits earned during the period of regulation. Such a mill would pay a rate of tax based upon its earnings for the taxable year 1917–18, presumably kept within moderate bounds by the regulations of the Food Administration, and therefore presumably taxed at a low rate.

Other unexpected and apparently inequitable results ensued from the operation of the excess profits tax law. Some were connected with the different rate of capitalization of different mills, due to their varied history (in the past). These brought it about that mills with low capitalization were generally more heavily taxed than mills with high capitalization. Certain mills again, unlike the majority (?), had made small profits during the first half of 1917 and, having been assigned a heavy grind in the autumn of that year, made larger profits during the food regulation period, with a consequent tax rate different from that of their competitors.

This whole problem of the incidence of the excess profits tax and income tax was referred by Mr. Hoover to a commission headed by Professor F. W. Taussig, appointed in March, 1918, to consider some of the problems of regulation of the milling industry and to make suggestions for improvements in the regulations already issued and for the recasting of the whole method of regulation for the crop year beginning July 1, 1918. This commission gave much attention to the question raised by the interposition of the excess profits tax upon the milling regulations issued by the Food Administration. It was impressed by the inequalities resulting from the rigid application of the Food Administration's announced intention not to recognize excess profits tax payments as items properly chargeable against costs of production by the mills in their accounts with the government, but it felt itself unable to attempt to readjust these conditions or to bring about identity of treatment for the different mills. It therefore reported that excess profits taxes, and income taxes also, should not be regarded as items of expense but as public levies which must come out of the profits of producers, as had been the normal case with all such taxes. The Food Administration acted promptly upon this recommendation and on May 15, 1918, announced to the trade that these taxes must be borne by the producers and not charged to the public. In one respect, however, the discussions before this commission of inquiry brought about a modification and readjustment in the operation of the excess profits tax. As has already been explained, many mills made profits larger than the allowable maximum during the closing months of 1917 because of the rush of grinding operations at that time. These large profits, in excess of twenty-five cents per barrel, were necessarily treated by the Food Administration

as "paper profits"; since, if maintained through the season, i. e., until June 30, 1918, they became subject to refund in one of the forms already indicated. It was possible, however, that the Treasury Department would consider the profits made during this period as taxable to their full extent, irrespective of the circumstance that the Food Administration would compel mills to cut them down sooner or later. As a result, however, of conferences between legal representatives of the Food Administration and of the Treasury Department, an arrangement was made by which these "paper profits" (in excess of twenty-five cents per barrel) were considered as not necessarily part of the taxable income of the mills, but as subject to readjustment and abatement after proper verification and certification by the Food Administration, subject to suitable regulations by the Treasury Department.

XXI

The results of the year's milling operations under the *cost plus* method of regulation, while as satisfactory, perhaps, as could have been expected, indicated abundant opportunity for improvement. It was possible to formulate new plans of regulation with greater confidence because of the circumstance that the minimum price to the producers for wheat of the 1918 crop was a matter of formal government guaranty — a feature entirely lacking in the 1917–18 program. To this fundamental measure the entire food program, so far as wheat and flour were concerned, could be adjusted.

The probability of a continuance of the war for at least another twelve months made it prudent to enforce a continuing measure of conservation of wheat flour in the United States during the crop year 1918–19, in spite

of the increasing stocks of wheat in Australia and the Argentine and the very large prospective crop in this country in 1918. This implied a continuing limitation upon competition in the manufacture and sale of flour. The large and fairly evenly distributed wheat crop, taken in conjunction with the fact that the functions of the Grain Corporation became somewhat different under the price guaranty arrangement, made it practicable to relax somewhat the restrictions upon the grain trade and to allow a wider range of competition there than had been possible with the short crop of 1917.

It is beyond the scope of this paper to enter upon a detailed exposition of the new arrangements which became effective in July, 1918. Suffice it to say that the Grain Corporation announced a schedule of wheat prices which it was prepared to pay at the principal terminal markets, based upon the minimum government guaranty of $2.00 to the farmer,[1] so arranged that the producers in the least advantageously situated districts could realize approximately $2.00 per bushel for their wheat at country shipping points. The control by the Grain Corporation of country elevators, as to retention and diversion of shipments,[2] was relinquished and shippers were permitted to sell to whom they would. The mills were also allowed to buy from whom they pleased and to pay any price they pleased; of course, the lower range of competitive bidding was established by the offer of the Grain Corporation to pay at least the government guaranteed minimum. As a matter of fact, removing the fetters from the free play of commercial initiative led to a premium of several cents per bushel over the government minimum being paid for wheat during the early weeks of the new crop movement, in

[1] The government guarantee then was $2.00; the President by proclamation subsequently made the figure $2.20.

[2] See page 18.

spite of a movement the size and rapidity of which broke all records.

The principal limitations placed upon the mills affected the prices which they might charge for their products, the quantity of wheat which might be used in making a given quantity of flour, and the kind of flour which might be made. The Food Administration had got over its scruples concerning its own powers as to price-fixing and imposed upon the mills a fixed operating differential or margin — a figure by which the combined prices of flour and feed might not exceed the price (reckoned on the government purchasing basis) of an equivalent amount of wheat. The ratio of extraction was continued at 74 per cent (i. e., 4.4 bushels of wheat per barrel of flour), and the differential for the combined prices of a barrel of flour and the corresponding amount of offal (about 68 pounds) above the price of 4.4 bushels of wheat was set at $1.10. In other words the differential of $1.10 per barrel of flour included costs and profits. Thus, if the government price for No. 1 Northern wheat at Minneapolis were set at $2.20 per bushel, the price of 4.4 bushels would be $9.68, and the combined prices of flour and feed at the mill door might not exceed $10.78; further, if the government named price for mill feed (at say 41 per cent of the price of wheat) averaged $30.00 per ton, or one and one-half cents per pound, at that point, the maximum price for flour at the mill door would be $9.76. These regulations were easy to police since prices could be readily checked by the reports required from flour jobbers and buyers. Furthermore, they were compulsory; there was no element of voluntary agreement in them, as with the arrangements of 1917–18. Hence it became possible to dispense with the elaborate and expensive machinery of

the Milling Division, which accordingly went out of existence. In its stead a milling section, with a representative miller at its head, was established in the new Cereal Division, of which the Grain Corporation also became a part.

It is too early yet to form any conclusion as to the efficacy of the new plan of regulation, but at this writing (August, 1918) it seems to be working well. There has been very little, if any, complaint as to inability of farmers to secure the full guaranteed minimum price which the Grain Corporation stands ready to maintain at all times and in almost all places. If, through lack of competitive bidding at local points, farmers fail to secure the full government price, the Grain Corporation will accept direct consignments, paying the shipper at least $2.00 per bushel f. o. b. shipping point, less commission. The fixed differential mode of controlling the price of flour has the advantage of simplicity; it is easily understood in general principle; it definitely establishes maximum prices. Its application was possible only with the fixed base price of wheat to the producer and the requirement of a uniform grade of 100 per cent straight flour; [1] the fixed wheat price became the datum point from which the prices of flour and feed could be reckoned; under the "100 per cent straight" rule "flour is flour," while before this requirement there were as many different grades as there were mills.[2]

Summary and Critical Estimate of Results

Broadly speaking, the problems of the Food Administration at the outset of its career in the regulation of the wheat and flour trade were: (1) to attain price stability, for the protection of both producer and consumer; (2)

[1] See page 45. [2] See page 44.

to enforce conservation, in order both to guard necessary supplies for home consumption and to save for export; and (3) to distribute the available wheat to the mills so as to maintain relative equality among them and secure their milling coöperation. How far did the Food Administration realize its aims in meeting these problems in the crop year, 1917–18 ?

XXII

1. The stabilization of wheat and flour prices speaks for itself. It is a matter of record and represents an achievement of the first importance. The efforts of the Food Administration to control and eliminate speculation in wheat and its products may be said to have been almost completely successful. The grain exchanges at once complied with the request to suspend dealings in wheat futures; the spot market practically disappeared under a system where the mills did all their buying in terminal markets through the Grain Corporation. The licensing of all elevators and mills having storage facilities, and the limitation of the storage period to thirty days, put out of business the line and terminal elevator companies, so far as the speculative handling of wheat was concerned. More effective still was the practically universal agreement entered into by the millers not to pay for wheat a price in excess of the fair price adopted by the Food Administration for government purchases. This fixed the upper limit for prices offered by domestic purchasers; export buying was confined to the Wheat Export Company, the Grain Corporation, and the representatives of neutral nations — all acting in concert. There was no place for price speculation; the almost universal control by the Grain Corporation of the movement of wheat from farm to mill and to the sea-

board left no scope for speculative activity; it simply became an unremunerative business.

Only to a slightly less degree did the Food Administration succeed in eliminating speculation in flour. All licensed mills (some 6000 in total) were prohibited from taking orders for flour more than thirty days in advance of shipment, and from knowingly selling to any buyer such quantities of flour as would give him more than enough for his requirements for a reasonable period of time (defined by rule as thirty days). A national flour distributor was appointed, who got the flour jobbers in the most important consuming centers to agree upon maximum profit margins, based upon pre-war standards. Fictitious sales between a number of brokers or other intermediaries in the distributive chain, and resales within the trade with successive price enhancements, were strictly prohibited. Altho there were sporadic cases of violations of these rules, the response of the trade in general was excellent, and flour was kept moving in as straight and direct a line as possible between producer and consumer. After the first few weeks of Food Administration control there was a marked reduction in the price of flour at wholesale and this reduction was generally reflected in retail and bakery prices. The mill door price of flour at Minneapolis remained fairly constant at a figure around $10.00 per barrel from early in November, 1917, until the close of the crop year, with a tendency downward rather than upward.

Of course, the wisdom of the whole policy of price stabilization may be, has been, questioned by some economists, who express skepticism as to its practical utility as a war measure. Without entering upon a discussion as to the relative efficacy of the system of price variability and price fixation as types of economic organization in war time, a few words may not be out of

place at this point as to the desirability of a stabilized market in the wheat and flour trade in 1917.

The case against price-fixing, i. e., the establishment of maximum prices, is easily stated.[1] It is urged that to fix a maximum price for a commodity defeats, or at least retards, the normal equilibrium of demand and supply; that by fixing the upper limit to the figure which the producer may expect for his goods, production is, *pro tanto*, checked at the very moment when it needs to be stimulated. Leave the market alone, let buyers pay what price they will, and the price of the commodity in question finds its natural place in the whole scheme of prices and settles at that point which will exactly equate the supply (or production) to the demand, as measured by its price relative to all other prices whatsoever.

The matter is not so simple as this, however. The argument assumes a degree of flexibility in consumers' demand schedules and in the organization of production, as little in accord with the facts as is the tacit implication that the psychological aspect of extreme price variations is a matter of no consequence and may safely be ignored. Nor is it necessarily true that, once a policy of price-fixing is embarked upon there is no logical stopping place — that all prices, broadly speaking, must be worked out in nice adjustment to each other. A more moderate statement, and one nearer the truth, is that all interference with the normal operation of economic forces is to be recognized as an evil and that such interference should proceed no further than is necessary to attain the end absolutely required. Each case must be met as the necessity arises, and such action taken as the totality of social forces dictates.

[1] For example, see W. C. Clark: "Should Maximum Prices be Fixed?" Bulletin of Queen's University (Canada), 1918.

However all this may be as to price-fixing in general, it should be emphasized, in order to prevent further misunderstanding, that in the wheat and flour market in 1917, the *normal* forces influencing the price system had utterly broken down. The complete disruption of the channels of transportation between the world's more distant wheat fields and the great consuming markets of western Europe, a regrettable incident of the war, had thrown upon the crops and markets of the United States and Canada the burden of sustaining the whole impact of a demand for breadstuffs probably unparalleled in modern times. It was a burden too great to be sustained and the American marketing system, excellent tho it had proved itself in peace times, collapsed under the strain. It was absolutely imperative that some new and stabilizing organization be devised to take the place, temporarily, of this broken-down marketing machinery and that some price be established which should outlast the vicissitudes of a single month. The new wheat crop was smaller even than the short crop of the year before, the visible supply was at the vanishing point, the hedging facilities of the exchanges offered no real protection to the legitimate trader, the supply side of the market was helpless and disorganized, while the demand side was leagued into two powerful organizations as represented by the Wheat Export Company and the American millers. The distributing trades were in a deplorable state of speculation occasioned by the extreme price fluctuations of the spring and summer. Those consumers were hoarding flour who could afford to, while those who could not were clamoring for a reduction in living costs. American industry was passing through a series of strikes, wage disputes, and labor adjustments which seriously threatened to impair our whole national efficiency in prosecuting the war. In

these conditions a firm insistence that something be done to restore economic order, that some workable arrangement be devised to inspire confidence and quiet apprehension and alarm, was of far greater help to the nation than an attitude of laissez faire could possibly have been.

Another phase of the matter cannot be too greatly emphasized. This is the bad economics and worse psychology of the laissez-faire method of conservation by leaving things alone until mounting prices should enforce conservation upon those elements of the community who can least afford to pay the price and who, presumably, most need the goods. This is conservation with a vengeance; to quote Mr. Hoover's words, " it is conservation for the rich at the expense of the poor." The experience of April and May, 1917, should be a sufficient warning as to what might have been expected to happen had the restraining influence of the Food Administration been withheld. The unified and insistent buying of the Allies and the more or less panic-stricken efforts of American distributors and consumers to provide themselves with flour, would probably have been repeated with variation through the entire harvest year. The short crop would probably not have lasted more than a few months in these conditions; long before another harvest could have been gathered wheat and flour prices would probably have touched undreamed-of levels. All the results of unbridled speculation might well have been expected, with what consequences upon the temper of the industrial and consuming community can easily be surmised.

The one large class in the community who might conceivably have gained from such a state of affairs is the farmers. Yet even here it is doubtful whether the farmers' interests have not been better served by the

maintenance of a fixed price for wheat throughout the 1917–18 crop year. It must always be remembered that in enacting the Food Act in 1917, Congress had guaranteed the farmers a minimum price of $2.00 per bushel for wheat of the 1918 harvest. The Food Administration's "fixed price" for 1917–18 ($2.20) was determined by the Wheat Price Committee with due consideration of the guaranteed minimum for 1918–19. It could not be *less* (than $2.00) if hoarding was to be checked; nor could it well be very much *more* than the *probable* minimum for 1918–19. As matters turned out, the guaranteed price to the producers in 1918–19 was practically the same as the Food Administration's fair price in 1917–18. It must be remembered also that in September, 1918, President Wilson announced by proclamation the minimum guaranteed price for the crop of 1919 at practically the same figure as for the 1918 crop and that of 1917. Had the price been left uncontrolled in 1917–18 it might conceivably have gone to so high a point that many farmers would have profited unduly as compared with other classes in the community. From the point of view of social welfare this was a contingency to be avoided as much as profiteering by any one else. And had the price gone to a very high figure it would probably have proved extremely difficult to place the limit of the actual guaranty for the 1918–19 season at a point very much lower than what the farmers would have come to regard as normal. In these conditions there is no assignable limit to the amount of wheat which might have been planted in 1918–19, to the detriment of other crops and the live stock industries, to say nothing of the burden which might have been placed upon the government in making good its promise to guarantee to every producer the minimum price.

There was much clamor in some quarters in 1917 as to the inadequacy of the Food Administration's fair price of $2.20 per bushel, Chicago basis, and its probable repressive influence upon wheat planting for the succeeding season. The adequacy of this price, " fixed " as a minimum in August, 1917, and maintained as a maximum until the new crop year, beginning July 1, 1918, is perhaps best gauged by the fact that the acreage planted to wheat with the guarantee of $2.00 and some expectation (realized in September) of a continuance of the $2.20 price, was, with a single exception, the largest ever known; the seeding of winter wheat established a new acreage record. The Canadian price, which had previously been $2.40 per bushel, was lowered to $2.21 for No. 1 Dark Northern upon the announcement of the Food Administration's fair price of $2.20 in August, 1917; yet in 1918, Canada planted the largest wheat acreage on record in spite of a serious labor shortage. In the matter of a fixed price the Food Administration seems to have seen not less of the truth than its critics but more. The farmers received much more for their wheat over the season in 1917–18 than they had in any previous year, in spite of the " sky-rocketing " prices of May, 1917. The achievement of the Food Administration was to secure to the producer more nearly his " money's worth " than would have been possible under a system of variable prices and time speculation. This, coupled with the reduction of milling profits and the narrowing of trading margins all along the line, brought the producer's price and the consumer's price much closer together than they had been in recent years.

XXIII

2. In its conservation program the Food Administration cannot be said to have been as successful as in the maintenance of the fixed wheat price and the stabilization of flour prices. The terms of the problem as it appeared in August, 1917, were about as follows: (*a*) The United States had come into the new crop year, 1917–18, with stocks of wheat and flour from the old crop equivalent to about fifty to sixty million bushels — less than a month's requirements for our own population. (*b*) The new crop was very disappointing; it has been variously estimated at from 610,000,000 to 650,000,000 bushels. (*c*) European harvests were even more disappointing, and the partial failure of the Argentine wheat crop of 1917 and the ensuing embargo upon exports threw an even larger burden upon the United States and Canada than had been expected. (*d*) Because of the small stocks and short harvest in this country it was imperatively necessary to plant as large an acreage as possible in order to insure sufficient supplies for the new year. This meant the subtraction of a very large amount of wheat for seed — probably not less than 85,000,000 bushels.

The net result of all this was that if our normal rate of consumption should be maintained there would be very little surplus for export. In other words, almost the entire export quota would have to come out of a saving from their normal consumption by the American people. Measures had to be adopted, therefore, which would insure this saving, and yet prevent any part of our people from going hungry. Several courses were open:

(1) Rationing.

(2) A laissez-faire policy, leaving the Allied buyers free to enter our markets and bid up prices for our own

people as they did in May, 1917, to the point where the necessary saving in consumption would be secured through the medium of excessively high prices.

(3) An appeal for voluntary conservation and restriction of consumption by those elements in the community which could best afford to forego the use of wheat bread.

(4) Commandeering of the necessary supplies by government action.

The first two methods were equally impossible — the first because of the extraordinary complexity and expensiveness of the task, in a country as large as the United States, and because of its repugnance to American methods, and the second for reasons which have just been indicated.[1] At the outset the Food Administration announced its confidence in the efficacy of self-imposed restrictions on consumption by individual action, and for the first few months it relied almost wholly upon voluntary conservation to effect the necessary saving in food consumption. A widespread propaganda was instituted for the conservation of wheat, meat, fats, and sugar, and the billboards were mobilized in the campaign against waste and extravagance. The results, so far as wheat and flour were concerned, were upon the whole, disappointing. In justice it should be said that there was a very considerable saving of wheat flour by many persons in the community, a saving which represented conscientious and idealistic service. This appears to have been more than offset, however, by increased consumption on the part of certain sections in the community which were enjoying unwonted prosperity, growing out of the flush of war activity and high wages. Wheat flour was, thanks to the stabilized price, the cheapest food on the market, and there seems to have been a large increase in its use by people who, perhaps, had never had adequate nourishment before.

[1] See page 5, supra.

To expect conservation in these conditions was like trying to lift oneself by one's bootstrap. Towards midwinter it became apparent that the unprecedented rate of milling activity in the flour industry was not enough to enable us to fulfill our self-imposed obligation to our European allies. It was seemingly impossible to fill up the gaps in our own commercial stocks: demand continued unabated. One underlying reason was that there was a considerable amount of hoarding of flour by consumers who had laid in stocks during the preceding spring and summer and who still continued to buy all they could get.

The export situation became very serious; winter weather of unprecedented severity and duration, coupled with railroad and steamship congestion, and breakdown in the coal supply, had by January led to a serious falling behind in our rate of flour shipments abroad. In these circumstances some decisive action was imperative. It came early in the new year, shortly after Lord Rhondda's appeal to America to send more wheat to meet Europe's needs. On January 10, 1918, President Wilson issued a proclamation appealing to all loyal citizens to make fresh sacrifices for the Allied cause by reducing still further their consumption of essential foodstuffs vitally needed for shipment abroad. This appeal was backed up by wheat conservation rules issued through the Milling Division of the Food Administration, January 15th, and effective February 15th, which required the purchase of "substitutes" (corn meal, barley flour, rye flour, oatmeal) in a one to one ratio with wheat flour by all buyers at retail and the admixture by bakers of wheat flour substitutes at the ratio of one pound in four with wheat flour in making white bread. Only with the application of the "substitute" rules did the conservation program of the Food Administration become really effective. The total food

consumption of wheat flour in the United States during the eight months from July 1, 1917, to February 28, 1918, was considerably in excess of the corresponding figures for any year except 1915–16, and well over the average for the three "pre-war" years 1914–15 to 1916–17.[1] Net exports for the same eight months had fallen far behind the figures for any year since 1911–12.[2] In these conditions some decisive action to enforce conservation and stimulate exports had become imperative. This was supplied in part by the "substitute" requirements, which resulted in a great diminution of flour purchases, and in part by the requisition of a considerable part of the output of all the larger mills by the Food Administration. The proportion taken was at first (January to April) 30 per cent; later (May to June) it was increased to 45 per cent. This action, together with increased wheat imports, permitted a speeding up of exports of flour; until by the end of the crop year (June 30, 1918) 22,000,000 barrels of flour and 34,000,000 bushels of wheat had been shipped abroad. The net export movement for the twelve months was equivalent to a total of 132,000,000 bushels of wheat, from a crop which had promised to be scarcely adequate for domestic consumption.

A curious accompaniment of the intensified conservation movement of the spring months of 1918 was the voluntary relinquishment of stocks of hoarded flour by individual consumers, bakers, grocers, in response to appeals by the Food Administration. No estimate can be hazarded as to the amount of these holdings which were thus brought out; in the aggregate it appears to have been considerable. Their surrender was a testi-

[1] Estimates of U. S. Food Administration, Statistical Division, Information Service Bulletin No. 1045.

[2] Ibid. Net exports of wheat and flour from July, 1917, to February, 1918, were equivalent to 60,548,504 bushels; the average for the five years 1912–13 to 1916–17 (same months) was over 148,000,000 bushels.

monial both to the complexity of the task which the Food Administration had shouldered and to popular confidence in the degree of success with which it has been performed.

XXIV

3. The problem of equitable distribution of wheat to the flour mills by the Grain Corporation in 1917–18, was primarily a commercial problem and one of peculiar difficulty. Not only was there a short crop, but the existing supplies were so faultily located with respect to some of the large milling centers as to necessitate a considerable shifting of grain from one section to another as well as the importation of wheat from outside sources far in excess of anything known in previous years. The Grain Corporation, administered as a public agency by men who had been conspicuously successful in private life as practical grain men, established an enviable record for the uniform sagacity and fairness with which it handled the large problems of allocating the existing stocks of wheat in such a way as to fulfill our obligations to our allies and at the same time to prevent local flour famines in the United States. The achievement speaks for itself; no one went hungery in this country, and through the combined self-denial of millions of individuals here our engagements were made good to our allies in arms. This accomplishment was a splendid achievement of democracy at its best; the fact that many able men, inspired by Herbert Hoover's example, divorced themselves from their private interests and at great personal sacrifice devoted themselves to public work, rendered gratuitously, is indicative of a fine spirit which augurs well for American idealism.

WILFRED ELDRED.

WASHINGTON, D. C.

THE PRICE-FIXING OF COPPER

SUMMARY

Fixing price to consumer of a commodity necessary for war, 72. — Necessitates regulation of distribution, 73. — Copper industry unique, 76. — A unified industry, 77. — Demand for American copper decreased at beginning of the war, later expanded, 79. — Copper became practically a "cornered" metal, 87. — Coöperative Committee on Copper appointed, 89. — Necessity for price-fixing becomes apparent, 92. — Sources of supply, 99. — Risks encountered in expanding production, 100. — Increasing cost due to war conditions, 103.

GOVERNMENT price-fixing in this country has been a widely established practice in connection with our public service companies where the state grant of a franchise creates a legal or virtual monopoly, and also a duty to assure for its citizens uniformity of rates and protection against extortion. In recent years the exercise of these rights was taken over in part by the federal government, under its constitutional power to control commerce, and Congress gave to the Interstate Commerce Commission power to adjust and establish transportation rates. With the advent of war, however, the federal government was under the necessity of creating new machinery to marshall the nation's resources. The enormous powers given for this end have since the declaration of war become almost unlimited, and authority has been delegated to many persons in the name of the President. How far-reaching the industrial consequences of this control are, may be suggested by the fact that during the past eighteen months of war, prices as fixed cover the whole field of metals, chemicals, lumber, and other building materials, cotton and woolen textiles, wool, hides, and leather.

Price-fixing under present conditions signifies now a price determined to the consumer by a government at war, for a commodity deemed necessary for the winning of the war. In the case of copper, the United States, September 21, 1917, named a maximum price which was declared to be the one price f. o. b. New York, at which "supply" as produced, and subject to transportation adjustments, was to be available to all, including the government itself and the Allies, their civilians, and our own. It also provided against reduction of wages, which were then at their highest level. There was little copper for neutrals, and for them no price was fixed, tho such small sales as have been made were effected at the government price. Since August 30, 1918, the price fixed has not applied to civilians except in this country. There has been one advance from 23½ cents to 26 cents, and the price is now made f. o. b. cars or lighters at eastern refineries, f. o. b. cars or lighters at Pacific coast refineries for Pacific coast destinations, and f. o. b. cars or lighters New York, if shipped to eastern or interior destinations from Pacific coast refineries and from refineries in the interior of the United States. Present conditions including those in force as above, further provide that all shipments made after the period as fixed shall be subject to any change in price as determined by the Price-Fixing Committee, that all producers agree to take the necessary measures under the direction of the War Industries Board to prevent copper as distributed, from falling into the hands of speculators, who might increase the price to the public; and lastly that the producers pledge themselves to exert every effort necessary to keep up the output of copper so as to insure an adequate supply so long as the war lasts. Certain charges in excess of the maximum price, which however are here not important, were determined by the

Price-Fixing Committee on June 5, 1918, and concern copper shapes as delivered from the refineries.

Once a price is established, the same necessity that forces this step, also requires the government, sooner or later, to take responsibility for the regulation of distribution by a system, if need be, of priorities, rationing, and licensing. Price-fixing and priorities seek to prevent all private speculation and hoarding, and to control consumption by direction of both supply and demand. Further, the fixing of prices of any commodity makes necessary, gradually perhaps, but surely in the end, the determination of costs and profits, and so of prices for all stages of the production, from the raw material to the finished product, and from the producer to the consumer. There should be reasonable costs and profits for each stage. Up to the present time the practice of determination in our government price-fixing by the War Industries Board leaves to individual companies their extraordinary earnings which are due sometimes to the efficiency of their personal staffs, and again to the advantageous control of processes of production or of natural resources. Such extra earnings are then subject to an excess profits tax. With the copper industry, however, only two prices have yet been fixed for *refined copper*, first 23½ cents and then 26 cents. This government determination as to copper is an example of price-fixing in its simplest form.

Our government by its policy has successfully avoided legal complications. With fair adjustments and through the response of patriotism, yet also by the threat or act of commandeering, it has made workable its plan for *direction of industry* through *voluntary coöperative* price-fixing. There is no legal price-fixing authority except under the Lever Act for wheat and coal. These coöperative agreements with producers are made with duress

in the background; government duress being possible in the form of railway and fuel discrimination, priorities, licensing, or finally commandeering. Government direction of industry by these means is justified only as it stabilizes the industrial structure, eliminates profiteering, secures adequate production and the absolute control that the necessities of war require. Such enormous powers, increased as they are now by the Overman Act, and incapable of attaining more than approximate justice, require for their administration not men who will use so-called " political " methods, but men of high moral vision and recognized business experience.

Copper has been proved a metal of primary necessity to nations at war. Governments for their war needs create a new demand backed by unlimited and unquestioned buying power, which makes price-fixing inevitable. The enormous needs of the Allies were only to be met by concentrated buying from all selling agencies, and this buying was so urgent that any withholding against these large orders would have led to trade chaos with wide upward fluctuations. Even before our entry into the great conflict on April 6, 1917, the large producers and selling agencies had themselves found it impossible to meet trade conditions without at first from month to month, and finally in 1916 during most of the year, establishing for export sales an almost uniform price. During 1915 the rapid spending of money for copper raised, by monthly stages, the export price from 13 to 22 cents, while after February, 1916, this export price held between 26½ and 28 cents. From our entry into the war copper was one of the commodities first to have its price fixed for the government.

Copper as a metal combines easily with thirty-six other elements, is used as a component in hundreds of alloys, many having established trade names, and is thus

in very many ways industrially essential. It is in truth our best metal commercially, and in war times is without an effective substitute. Military demands that force high prices for copper are coincident with other war demands for essential materials, and with increasing prices for all possible substitutes. Aluminum, for example, was from the very first, almost entirely requisitioned for use, directly or indirectly, in manufactured products necessary for government purposes. In uses where copper is indestructible, as in telegraphy, telephoning, ship, engine and other motor building, locomotives and railroad work, the war requirements are at first very heavy. War business and our own installations for defense at home, call for very large supplies at once, and this great increase in demand must continue for some time to come. Lord Northcliffe's prediction, made over a year ago, is already far along in its process of fulfillment. His prophecy was that before the war's end, we should build several cities in France to care for repairs, for the assembling and reconstruction of equipment, and for the manufacturing of munitions. In munitions copper is destructible and there is a large annual and absolute loss. One-third of the copper used goes into fixed and semi-fixed artillery ammunition, where foreign experience has shown savings of about 80 per cent. Were a minimum of 5 per cent assured on all other artillery ammunition, including also small arms, there would be a total salvage of at least 30 per cent. As organization is bettered this percentage can be increased. United States government specifications, for example, require cartridges to stand twenty reloadings. Moreover, invention is bringing into use new, effectual, and lasting economies. Once these detailed readjustments are made, new construction completed and the necessary surpluses accumulated, renewal demands will follow in a much lesser

degree. If England's present experience may be our criterion as to stocks needed on hand for the prosecution of the war, there will remain, upon the cessation of the fighting, for all these uses, from motor vehicle parts to sixteen-inch shells, large accumulations of supplies — reserves for from ten to eighteen months, which at all times it has been deemed necessary to carry. But during the war the net result must be a very slow but nevertheless continuous accumulation of copper tending toward market saturation, when once the large program of construction is approximately completed and the manpower of the nations at the front has reached its maximum. Until the end, therefore, war demands must be urgent and not only discount present needs but also a long future.

As an industry copper production is in many ways unique, and its price-fixing problems essentially different from those of most other industries. In the agencies of production and distribution there has been far-reaching concentration. Much time and considerable sums of money are necessary to create a copper mine with a large output. After copper ore is once located, the equipment of the mine, the establishing of necessary railroad connections and the building of reduction works require not only millions of dollars of capital but also, under normal conditions as experience records, a probable minimum of five years for development. The Kennecott Copper Company, a most extreme instance, spent more than $20,000,000 before railroad transportation along the banks of the Copper River was even begun; and it is such development expenditures as this that must be risked, and within the life of the mine liquidated with interest. For the sake of suggesting proportion, and as roughly establishing Nature's part, it may be said that the purchase price of the located ore body is

to the cost of this necessary development construction, as one to one hundred, before a really large producing mine with profits available for dividends is secured. Increases come mainly from the large mines. This is further shown by the fact that, with 79.6 per cent more mines in the United States in 1916 than in 1913, more than 70 per cent of the increased production of the latter year came from mines of more than 10,000,000 pounds annual production, while the percentage from mines of less than 1,000,000 pounds production was but 3.55 per cent. As a mineral, copper is found in all our states except Florida. A list, however, of four hundred copper mines will include every mine throughout the entire world which produces in a year more than 200,000 pounds, or an annual gross value now for its product f. o. b. New York of approximately $50,000. After three-quarters of a century of development in this important industry, there are within the United States eighteen hundred and forty-eight mines producing copper. Of this number in 1916, the year of largest efficiency, thirty-one mines produced more than 85 per cent of the output, or 1,711,395,262 pounds, while less than 295,000,000 pounds were obtained from the remainder, or an average of 160,000 pounds to a mine.

Smelting and refining show within the industry still further concentration. In 1916, twenty-seven companies controlling thirty-six smelters in the United States produced more than 2,000,000,000 pounds of electrolytic copper. Refining capacity cares for imported as well as domestic ores, and in the United States exceeds smelting capacity. The refineries in 1916 treated more than 450,000,000 pounds additional from foreign sources. Six companies controlling ten refineries in the United States had a developed capacity in 1917 of 2,780,000,000 pounds; while two of the re-

fining groups handling their own and custom ore, had respectively an output of more than 750,000,000 and of 1,000,000,000 pounds a year. In smelting and refining, new processes, some of which are patented, are bringing great changes which tend to strengthen the few large companies. Flotation and treatment by leaching are the recent material advances in saving metal heretofore usually lost, and the increasing use of these discoveries may soon lead to the superseding of our great copper smelters. By the flotation process about 27,000,000 tons of copper are annually treated. A single company, the Minerals Separation North American Corporation controls patents which have been for a long time in litigation, at a cost to date of probably more than two million dollars. The rights under these patents ought soon, for the sake of the industry, to be determined finally by adjudication in the United States Supreme Court. The process is of enormous value in the treatment of base metal ores like zinc and copper, and is as great an advance for this industry as the cyanide process has been for gold.

Four selling agencies in 1916 handled almost 80 per cent of all the refined copper sold in this country for domestic and foreign consumption, and more than 66 per cent of the world production. The increase of 62.3 per cent in the United States output of copper from 1914 to 1916, coming so largely from mines with an annual production of more than 10,000,000 pounds has steadily made for concentration which has been secured with only small additions to capital obligations. Today the entire industry represents an American investment of approximately one and a half billion dollars. Its product for example is in wide contrast with coal, in that refined copper is practically the same in quality the country over; is sold in the trade f. o. b. as of New

York with freight adjustments; and in this price are included all the transportation costs from the mine to the refinery. While copper can be entirely withdrawn from all but war uses, coal is essential to every one and its conservation must everywhere be enforced upon consumers through nation-wide control of output and distribution. Because copper is so far a primary necessity of war, and because the American copper industry is so unified, and withal represents so large a proportion of the world production, copper, its output and its market, must be studied from the beginning of the great war, if the necessity for our own government action and its effectiveness is to be understood and justified.

The copper market problem of 1914 and 1915 was the familiar one of adjustment of supply and demand, but during the last six months of 1914, because of the world-wide industrial paralysis due to the war, it was one of adjustment of supply to a *minimum* demand. Domestic deliveries in normal times exceed exports, but for three years, 1911–13, the domestic deliveries failed to equal the foreign, and the average excess of exports was at the rate of 1 per cent a year. The exports for eighteen months, to June 30, 1914, however, were almost 25 per cent in excess of domestic deliveries; and of the total of 1,358,000,000 pounds exported from the United States, 827,000,000 pounds, almost wholly for German consumption, were shipped to Holland and to Germany. The increasing momentum of this export movement, and the contrasted domestic minimum of demand, are shown by the fact that foreign deliveries in the first six months of 1914 were 489,000,000 pounds, an excess of 48 per cent over domestic deliveries, which were 330,000,000 pounds. Electrolytic copper, the standard grade of copper in the United States, sold in New York in June and July before war was declared, at the lowest price

since December, 1911. While general business in the United States at this time was at a low ebb, German prosperity, if copper imports were its true measure, was at its height. But now it can be recognized that German manipulation for the purposes of accumulation was the large factor which depressed prices. Until this time and for a generation German interests had dominated the metal output of the world.

The beginning of the present war suddenly cut down demand still further. Copper circles had to repeat the trade experience of 1908–10 when demand had fallen sharply. Copper for three years had remained at the low average of 13⅛ cents a pound. By this experience the trade finally and fully learned that widely fluctuating and abnormally high prices are a real damage, and that to keep on producing when consumption is below normal means demoralization of the market through huge surpluses which depress values until low prices enable the floating supply to be absorbed. An increase in smelter production in 1912 of 13.3 per cent was followed in 1913 by a decrease of 1.5 per cent, but the output of the refineries continued to increase and 1913 exceeded 1912 by more than 25 per cent. In 1914 through June, refinery production again increased at the rate of 3 per cent, or to a total of almost 140,000,000 pounds a month. However, the smelter production of 1914 had shown a loss of more than half of the 1912 increase of 13.3 per cent. Large foreign consumption and some pre-war absorption for later war needs, had nevertheless carried the world's visible supply in October, 1913, down to 90,000,000 pounds, the lowest since the figures of the Copper Producers Association were first issued in 1909. These trade factors were in the main without effect in changing the downward trend of prices. New low levels of proven cost for pro-

duction by the porphyries, and the increasing output of these so-called low grade mines, were further depressing to the market and unsettling to confidence. The Copper Producers Association's figures, and their authoratative publicity had been without any significant effect in adjusting supply to demand. As a consequence of the general industrial paralysis following upon the declaration of war, publicity of figures was discontinued, and the trade accepted the absolute dependence of the United States as a producing country, on protective and positive measures for adjusting supply to demand.

Decisive steps for curtailment were taken, and some mines improved the opportunity to make large alterations and new installations. Opinion was almost unanimous that it was better to assure *fair* prices on *moderate* output — an output which is not excessive in proportion to demand — than *low* prices on *excessive* production; that it was better to store copper in the ground until future industries required resumption of mining, than to sell at a small margin of profit or even no profit. A large producer used to say, " the difference between a good and a bad copper market is a difference of 5 per cent in supply." In truth, experience has taught that copper is a product involving too large quantities to be stored anywhere else than in the ground. The " vein mine group," as contrasted with the porphyries, acted promptly. Curtailment was radically forced. Even refinery production, which is not at once affected by the action of the mines, and which had been steadily increasing, except for 1.5 per cent shrinkage in 1911, averaged in the last six months of 1914, 30,000,000 pounds a month less than the monthly production of the first half of the year, or a decrease of more than 22 per cent. Shrinkage in imports was a factor. This curtailment, however, was offset by demoralization

at home and abroad. War demands were slow in absorbing supplies on hand, increased as they were by large existing stocks of old copper and scrap. Prices generally tended downward, and electrolytic reached its lowest monthly average, 11.40 cents, in October of 1914.

Market conditions recovered from their demoralization slowly. It was January, 1915, before prices were above 13.49 cents and so above the pre-war level, and June before imports had recovered. The foreign visible supply, having from the beginning of the war increased 25 per cent, began in July to decline, and in December exports exceeded those of July, 1914. Domestic deliveries, after the first six months of the war, began rapidly to increase, and were estimated for 1915, at 1,043,000,000 pounds, a gain of 425,000,000 pounds over 1914, or a 68 per cent increase, after the drop in 1914 of 23 per cent from the 1913 figures. There must be added to this large gain in consumption the increase in the refined product from " secondary copper," which amounted in 1915 to 140,000,000 pounds. The major trade factors in 1915 were the increased domestic deliveries of more than 565,000,000 pounds of copper; the loss, to a market long supported by foreign buying, of the export trade with the Central Powers, or approximately 450,000,000 pounds; and the evident manipulation of the London market, for " standard." If the purpose of the manipulation during this period could be fully shown, it would appear that intelligent effort was steadily made to regulate the prices of copper as well as of other materials before placing large orders in this country, for *prices* were fundamentally related to war contracts. The handling of the market also proved conclusively that export values were as long as possible kept stable, while the domestic market was intentionally left to take the shocks and slams of fluctuating demand

and its exaggerating accompaniment, speculation. Exports from the United States fell off 25 per cent, and England imported almost 10 per cent less than in the previous year, yet imports to France, Italy, and Russia from the United States increased more than 75 per cent, and of our total exports these countries took more than 60 per cent. The price variation on exports was from 13 to 22 cents. For these reasons, with the needs of so many warring nations to be measured, copper statistics were confusing, and unintelligible except to the large American agencies which were acting for the Allies in the placing of war orders.

The advance in prices that began in October of 1914 continued throughout 1915. Into our market, at the very beginning of the war, came an enormous buying power to be used for the purchase of supplies. England had wide general credit in this country, and the French government, through borrowings and by actual deposits of gold increased very largely its banking credit. The extensive purchases of copper were handled in such a manner as not to force a rapid market rise of price, but so as to restrain buying, and with very remarkable success kept the market from becoming erratic or excited. On the 15th of January, 1915, Morgan & Company made public announcement of the fact that they had become the commercial agents of the British government in directing the purchase of supplies in the United States. At a later date they accepted similar responsibilities for France, and their purchases early in 1915 were reported as averaging $10,000,000 a day. With this buying power concentrated in American agencies, it is significant that there followed in March of 1915 President Wilson's announcement, in connection with the Webb Bill, in which steel and copper producers were vitally concerned, that the administra-

tion was not averse to the combination of American interests to further foreign trade. Shortly after, in May, a trade paper stated that "Great Britain was in control of the world's copper supply outside of Germany," negotiations having been for some time in progress, with the expectation of controlling the output of the large American producers. The fact is that the monthly average prices of copper advanced without reaction, and on good news as well as on bad, until July, 1915, when after a slight recession from 19.71 cents to 17.22 cents, they rose in December, 1915, to more than 20 cents. Speculatively, copper in June sold up almost to 20 cents, discounting after almost a year of war, the probability that in spite of many factors of uncertainty, consumption would overtake available supply. The speculative forecast became a reality in December. For the first time in history American producers had enjoyed an advance in prices starting with a production many millions of pounds below normal. The demand for copper was enormous, and constantly increasing not only in the usual industries — electric transmissions, brass manufacture, castings — but for motor vehicles, munitions of war, and for the various needs in connection with the operations of the steel mills. There was no domestic business of consequence requiring the use of additional copper in hardware, building supplies, and furniture. Government orders and war needs had, by the end of 1915, very largely reconstituted the "demand," and the "supply" was thereafter to be the utmost that American resources could produce. The mistake in this period for the foreign buyer was his failure to contract for supplies well into the future. By the end of 1915 the market had passed from the control of the buyer and was dominated by the large selling agencies which, in their turn to prevent a runaway mar-

ket, sought to dictate the distribution of copper and a steady price.

From December, 1915, to February, 1916, there was from the December average of 20.35 cents a rise of more than 7 cents, and except for one month, prices did not react below 27.35 cents until July, 1917, a period of eighteen months. Copper companies had so far sold their 1915 production that there were practically no spot copper and almost no futures available for the first quarter of 1916. The large purchases of manufactured copper in the United States were being financed by foreign governments especially to guarantee deliveries. Just at the close of 1915, December 22, the Anaconda Copper Company sold 120,000,000 pounds of copper at 22 cents, and thereupon apportioned the amount among the largest selling agencies in New York. This was the first announced sale in which American interests publicly acted together and divided an order. To allay trade fears it was at once stated that the large producers were determined to keep metal prices at a reasonable figure, and that attempts to sell copper at a price which was regarded by them as exorbitant, would be discouraged. The producers' helplessness, notwithstanding this expression of trade determination, is shown by the fact that in 1916 the average monthly prices per pound for copper were more than ten cents above the average for 1915, and within forty-five days after the Anaconda sale, copper sold above 27 cents. Had the market been left to itself and freely subject to supply and demand, intensified by the speculation usually incident to a rise, copper would have commanded famine prices with violent fluctuations. Voluntary self-determination of the trade as to price and distribution — distribution being as far as possible based on actual consumption — for a time ac-

complished much toward establishing stability but could not itself control the working of economic forces.

The year 1916 was in many ways a maximum year to date. Production of refined copper in the United States was 1,927,000,000 pounds, an increase over 1915 of 38.9 per cent, while the gain in 1915 over 1914 had already been 20.7 per cent. The monthly and yearly average of prices was the highest since 1873. But the most striking feature of the year was the phenomenal increase of consumption in the United States because of foreign business placed here in manufactures. Twenty-one domestic concerns, according to a trade paper, used in 1916 more than one and one-half billion pounds of copper. The foreign orders were the largest ever known, and sales, with approximate prices, including the one by the Anaconda Copper Company in December, 1915, were as follows: to Great Britain, December, 1915, 120,000,000 pounds, at 22 cents; to France, March, 1916, 100,000,000 pounds at 27 cents; to Great Britain, April, 300,000,000 pounds at 27½ cents; and to England and France, September, 1916, 448,000,000 pounds at 27 cents. This total of more than 950,000,000 pounds that Great Britain and her allies took from the market, together with what was contracted for by American consumers, left the refineries bare of supplies. For the last three months after the large September sale, copper averaged 31½ cents. Domestic buyers, because of high prices, had allowed stocks on hand to run low, and then with the continuing advance, hesitated to accumulate supplies. During 1916 the market was thus in a feverish speculative condition. In spite of the increase in the output of copper through 1916, the average price of 33.84 cents for the last month of that year proved to be the year's highest monthly average. The discontinuance, in December, by England and France of the

publication of statistics of foreign visible supply, and on January 1, 1917, the formal taking over, by their respective governments, of all the English and the French copper stocks, were public acknowledgments of an undeniable world scarcity of copper.

Copper was indeed practically a " cornered " metal. Heavy government buying had to continue, and a change of policy was necessary. The last Anglo-French purchase had been sensational both in its size, and because of its admission that it should be deemed expedient to provide in September so largely for deliveries throughout the following year. While manufactured products, wholly or partly finished, continued to be purchased in record-breaking quantities and at the highest prices, foreign governments thereafter, instead of taking specified amounts of refined copper, bought only from time to time, and at the best possible price, such copper as could be secured from the large producers. It was believed that by the establishment of this new policy the market in the future would not be stimulated by figures of exaggerated totals such as were rumored during the last weeks of 1916. Except on two occasions in 1917, no large sales have since been featured in the trade news.

Tho in the minds of some people the country was tardy in declaring war, it is to the credit of the Administration that the machinery for government direction in marshalling the nation's supplies and in controlling the productive forces was early provided. The United States Council of National Defense, composed of six members of the cabinet, was created by an act of Congress, approved by the President, August 29, 1916. In March, 1917, the council was fully organized and the President appointed an Advisory Commission of seven men expert in various lines. Bernard M. Baruch having

special knowledge of minerals and metals, was made chairman of the Committee on Raw Materials, Minerals, and Metals which was created to study and report on all sources and possibilities for securing such materials as were needed by the government. This was not a purchasing committee, but on the 23rd of March, Mr. Baruch announced that a sale had been made to the government of 45,000,000 pounds of copper at 16¾ cents a pound, for delivery extending over the twelve months from April first. This figure was based on the actual ten-year average of sales made by the United Metals Sellings Company from 1906 to 1916. Since the average price per pound during the first three months of 1917 had been 30.634 cents, there was to the companies accepting this figure an estimated loss of almost $14,000,000. The first annual report of the Council of National Defense, 1917, states that at this period "the market price was about 35 cents." To explain this transaction it should be remembered that a division of opinion as to our nation's attitude toward the war existed throughout the country and was especially marked between the different sections. In the financial circles of the East, there was more nearly an unanimity of opinion as to the necessity for the country's entrance into the great conflict, and this united action of the copper producers was intended as a patriotic demonstration that here was a powerful industry not seeking opportunities for profiteering. Only one of the large companies refused to accept a share in this sale. The price, however, was not justified on any economic principle, since too large a proportion of the nation's output could not be produced for this sum. It is a grave question whether the transaction accomplished what its sponsors desired, and what the companies certainly deserved to achieve by so large a sacrifice.

On the 18th of May, 1917, the Coöperative Committee on Copper was appointed by the Committee on Raw Materials, the members being representative producers of copper, with John D. Ryan as chairman. The purpose of the Coöperative Committee on Copper, which immediately began work, was to supervise the production and the distribution of copper by the private companies for the period of the war, and it was announced that if the committee were successful in its endeavors, the necessity for commandeering the mines for the sake of securing copper to make munitions would be removed. The burden of these tasks, however, was some four months later absorbed by the Copper Producers Committee, and the Non-Ferrous Metals Section of the War Industries Board, and the Coöperative Committee on Copper ceased to be an active agency.

The General Munitions Board of the Council of National Defense was appointed in April, 1917, with a membership of twenty-four, seventeen from the Army and Navy, and seven civilians. In June, it arranged with the approval of the Chief of Ordnance, for the purchase of 60,000,000 pounds of copper at 25 cents, but the transaction was not approved by the War Department. It was clear that the Secretary of War did not wish to assume responsibility for a price of 25 cents, and therefore requested that the issues of profits and costs be determined by the Federal Trade Commission. On July 30, 1917, the General Munitions Board was succeeded by the War Industries Board, composed of eleven members. Its function was to control the production and distribution of all commodities essential to the conduct of the war, giving special attention to the vital war problems relating to raw material, finished products, and priority. Authority was thus given to determine ways and means of creating, as well as of

using the industrial agencies of the country, and also power to measure the relative urgency of the different government services. Three of its members were constituted a commission to arrange purchases, except where foodstuffs were involved. One of the duties of the War Industries Board was to fix prices, but later, on March 4, 1918, this power was delegated to a Price-Fixing Committee with Robert S. Brookings of St. Louis as its chairman. This committee was appointed by and reports direct to the President. The membership was limited to nine including the Chairman of the War Industries Board ex officio. Four are civilians, of whom three are members of the War Industries Board and one is the labor representative, while the Army, Navy, Fuel Administration, United States Tariff Commission and the Federal Trade Commission, are each represented by one member. Its duties include not only the passing on prices but the establishing of a price-fixing policy, and the assisting, if desired, of the executive departments in the adjustments of difficulties growing out of price-fixing matters. Prices are determined by the committee after costs as a basis have been reported on by the Federal Trade Commission. But the committee's determination which is final, must have measured not only costs, but also have considered problems of production and distribution as well as profits as they are related to prices.

In the fall of 1917, the I. W. W. strikes in Arizona and Montana seriously crippled these sources of production and accentuated because of shrinking supplies the need of further coöperation in allotting copper. But the immediate cause of the next step in the organization of control was the fixing of the price of copper on September 21, 1917, at 23½ cents. By this act demand and supply as factors were gone, and additional new ma-

chinery was needed to control distribution. Seven days later, September 28, 1917, a Copper Producers Committee was organized, and became the controlling and distributing body for the producers. Strikes and operating problems have not been their concern, and no step has been taken by them to increase production. On October 22, the Section on Non-Ferrous Metals — antimony, aluminum, copper, lead, mercury, nickel, and zinc — was appointed with Eugene Meyer, Jr., as chief. In February, 1918, Pope Yeatman succeeded to that title. The Copper Producers Committee became a close interlocking agency with the Priorities Committee and with this section of the War Industries Board to help the government in securing its necessary requirements under the new conditions.

The Copper Producers Committee was named at a meeting where practically all the producers were represented directly or by their selling agents, and thereafter it acted for the industry in dealings with the government. The committee was clearly understood not to be in an advisory relationship to the government, nor was it a legally authorized agent to act for the producers. Two companies, however, became the virtual business and selling agents. The United Metals Selling Company, in connection with the sale to the government in March, of 45,000,000 pounds at 16¾ cents, had volunteered its assistance to the Coöperative Committee on Copper and accepted the responsibility for allotting to the producers the several amounts, and for distributing the same as received from those who shared in this transaction. It was natural, therefore, that they should volunteer to continue as agents in making the necessary business adjustments between the producing companies and the government in the distribution of supplies in this country. On the other hand, the American Smelt-

ing and Refining Company, because of its long experience and its very large export business, voluntarily assumed a similar responsibility between the producers and foreign governments. This service, involving for the companies a considerable increase in their staffs, has continued to be maintained without expense to the government. Because there was not enough copper to meet the demands, all companies were assured orders in their proper proportion, and the right of the committee to act in this capacity for all met with no organized opposition. In case of need, this committee could rely on government duress, so they with confidence pledged the government that they would answer for all producers accepting for their output the government price, when and as fixed. Since their organization, they have successfully carried out the terms of that agreement.

With our entry into the war, the situation had become absolutely taut as regards supply. There was hardly enough copper to meet contract needs, and then only enough through careful coöperation, through the inventorying and watching of supplies, and the gradual calling into use of existing stocks wherever found. Every pound of copper had to be allotted by the careful matching of output with the consumers' needs, and where some particular brand of copper was required by the government, existing contracts were released. The general program for the Army and Navy was growing enormously. The Secretary of War's estimates began at $2,800,000,000, and $3,000,000,000 was provided. But in December $6,000,000,000 more was asked for, and five months later when the bill was passed, the amount was $12,000,000,000. It was natural that government agencies should each for themselves seek to get supplies for their own needs or for the private contracts which each had placed. War uses controlled, and individual ambi-

tion for immediate results was allied to patriotism. The inexperience of all concerned in war business, fear of profiteering, and mistrust of business leaders, were further factors that lead inevitably to competitive rivalries and congestion. This brought about marked contrasts — accumulated stocks in one quarter, and starving in extreme want in another. Such were the abnormal and almost panicky conditions in the fall of 1917, requiring supervision and ordered control by the government agencies in coöperation with the Copper Producers Committee.

The agreement between the government and the producers was reached September 21, 1917, when with the approval of the President a price of 23½ cents f.o.b. New York was announced to continue for four months. The advances to the government at this figure during the six months and more from April 7 to September 21 amounted to between ten and fifteen million dollars. For our own government this was the price of its copper from the beginning of the war, while for the Allies and their civilians as well as our own, this price became operative on and after September 21. The Allied Purchasing Commission which was appointed to prevent conflict between foreign government purchases and our own, had on September 6 arranged a sale of 77,000,000 pounds at 25 cents in behalf of England, France, and Italy, and the terms of this sale were not changed. Twenty-five cents had been the lowest price at which the producers had been willing to sell, so 23½ cents was a compromise, since the government's first and lowest counter offer had been 18 cents. With the costs of production as established at the beginning in 1917, this price, unless averaged down by the sale at 16⅞ cents in March, 1917, was too generous to the companies for a similar proportion between costs and profits to be long

hoped for or continued. Increased costs, however, soon changed this proportion until now it can be safely contended that for most producers, the profits after taxes are computed, are below the normal for the pre-war period before 1914.

The interval of uncertainty between March 23 and September 21, 1917, as to what would be the final agreement between the government and the private companies as to price and as to the methods of handling future business, largely curtailed new buying except for immediate needs. Deliveries, however, were speeded up so that the large Anglo-French order of September, 1916, the whole planned to provide for the year 1917, was filled by July, and old contracts continued to absorb all available output. Prices dropped to their lowest level, 24½ cents, in July and in August of 1917, with but very little copper changing hands. Nevertheless, the average during the entire interval of delay from April through September was as high as 27.29 cents. The course followed by prices during this period proved conclusively that consumption for a long time had been running at a rate which had exhausted surplus stocks. The 1917 average for nine months through September was 28.4 cents, and this even tho it was well understood that government price-fixing meant lower prices for the metal. The remarkable fact is that the market had been thus stabilized and speculation so largely controlled during a period when producers might have commanded 15, 20 or even 25 per cent more for their copper, if scarcity value had been placed on their output.

In January of 1918, conferences with producers in Washington resulted in the continuance of the existing price until June 1, 1918. The last of May there was a further extension to August 15, to which the producers did not agree. This action of the Price-Fixing Com-

mittee was the source of much misunderstanding, as many felt that with the facts in hand as to added costs, the old price should not have been continued for seventy-five days. On the producers' side, some sold their copper under protest, assuming the price was soon to be advanced, and others acted on the belief that the price had been fixed to August 15. The consumers, however, were almost unanimous in their assumption that the price was fixed, and made their contracts accordingly on that basis with the government and with private contractors. On the 2d of July the War Industries Board announced an interim advance to 26 cents for the period from July 2 to August 15, pending the decision for a longer time on or about August 7. Increased costs had definitely accrued through advances in freight rates effective June 25; immediate increases in wages were pending, and necessary adjustments required added money allowances to the refineries. On these facts as presented by the producers and in so far as they could be actually measured, the committee acted, granting a portion of the advance desired, but not the full amount of the added costs. No distinction in price was granted to the so-called high cost producers. Because of the suddeness with which this interim advance was made, there was considerable further confusion within the trade and consequent losses, so that similar action is not likely to be repeated. The analysis of the copper companies and their costs which was made by the Federal Trade Commission and reported to the War Industries Board in July, 1918, has not been given to the public. At the hearing in August, the price fixed was continued at 26 cents to November first. On August 30, the Board ruled that no price was fixed for civilians of Allied countries. As in the case of neutrals however, for them very little copper is available, and indeed no copper can

be exported without a government license from the War Trade Board. On October 26, 1918, a virtual agreement announced by the War Industries Board was made effective by the President's approval, continuing the price of 26 cents to January 1, 1918. The *Wall Street Journal* estimated, in September, that with a monthly production of almost 200,000,000 pounds of refined copper, only 5,000,000 pounds or 2½ per cent was then available for uses not directly or indirectly connected with the war, and of this small amount the large proportion was exported. By October, as a result of the plans for the great Spring drive in 1919, and for the equipment of an army of four million and more men for overseas service government demands exceeded all possible production. Price-fixing of copper has thus come to mean for this country practically a price determined by the government to *itself* as the consumer of a commodity, every pound of which is deemed urgently needed for the winning of the war. Priority orders, not advancing prices, are therefore now the effective agencies for securing to the government the necessary product and distributing it so as to meet the nation's needs.

The sequence here developed as to the general principles of price-fixing in the United States, the nature of the particular industry, the uses of its product, and the history of market conditions before and under government control, makes clear the necessity of a price being fixed for copper. A price fixed for any commodity must first be justified as necessary. Then this action must be related to other agencies of government war control so that altogether they may prove wisely cooperative and constructive, if the government is to secure adequate production for the winning of the war. Not necessity alone, but, to use the suggestion in the phrase " quality of mercy," it is the " quality of wis-

dom" in the exercise of these great powers that is the final test.

As incident, therefore, to the further fixing of a government determined price, war control agencies must continue and do much more work than they have yet done, to secure needed supplies, or even to restore the maximum production of 1916. Besides they must obtain added supplies through the better organization, as well as the increase, of all the factors of production and distribution. Already prices largely affecting copper costs have been determined for coal, coke, steel, and lumber. Still further to control costs, prices may be fixed for other materials as well as for the by-products. The Railroad Administration and the Priority Board by their orders can secure greater swiftness and promptness in deliveries, and this is especially essential as this industry is peculiarly dependent on transportation facilities. For instance, most of the blister copper must be brought from smelters in the West to refineries on the Atlantic seaboard. One large producer estimated that the loss in production for the year 1917 amounted to over 200,000,000 pounds, through coal shortage, railroad congestion, and the I. W. W. strikes. And this includes no measure of loss from temporary shut-downs, intermittency, and inefficiency of labor and its enormous turnover, due both to the competitive bidding in industry and to the high wage scale paid on direct government work.

The registration on September 12th of men between eighteen and forty-five demands new intimacies of coöperation between the government agencies and industry. This last draft inevitably means serious impairment of the nation's output. It will affect copper together with other war necessities, through the withdrawal of workers from essential industries, and through

mistakes growing out of the difficulties in assessing the value of individual men to their respective organizations. Men in the draft, if our experience proves similar to England's, may, therefore, actually be sent into military service abroad, only to be called back because found to be more needed in industry than in the trenches. And yet, " to be called back " will for our soldiers mean to be withdrawn from the military into the industrial service in Europe, in order to meet there our own increasing needs, not only to repair equipment, but also to supplement and complete that which we have failed to perfect here.

Labor adjustments under the control of the National Labor Board, and enforced by the President, promise regulations which will minimize the loss of time from labor disputes. Under the United States Employment Service, organized and effective August 1, 1918, there is established a monopoly in the distribution of so-called unskilled workers, which is intended to reduce the waste due to our unprecedented labor turnover. This form of government aid will prove helpful, but a mining industry is not easily recruited from unskilled labor. If copper production is to increase, trained miners must be taken from the poorer and smaller metal mines and allotted to those copper producers who have the greatest capacity per unit of man-power, for the greater proportion of our production comes from a few large mines. One-half of the entire output of copper in this country comes from mines whose production in terms of pounds per man varies from two to six times the average of all the less advantageously worked ore bodies. In 1916, 85.22 per cent was produced by thirty-one mines, and their percentage of the total gain was 90.74 per cent. But under the constitution of our democracy no man can be forced against his will to work, except after being

drafted into military service or under threat of losing his rights to exemption. Such constraint will be used to increase efficiency and reduce labor turnovers, and to this end standardization of wages may yet be effected. As these government agencies of control are successful in setting in order the organization and the processes of industry, it is the function of the Price-Fixing Committee to measure the costs, and assure reasonable profits to private interests only so long as their facilities of production are essential, adequate, and efficient, and not wasteful of man-power.

Granted that these government agencies give adequate coöperation in meeting the needs of the industry, there remain three sources of supply which require particular consideration and perhaps special prices for their copper in order to secure adequate production. These are, first, the mines in foreign countries; second, the so-called high cost producers; and, third, ore bodies in this country fully explored but not now being developed. Increases could be secured from foreign sources, if shipping were assured. Chile might continue her annual increases in production — 39,000,000 pounds in 1916 over 1915 — but tonnage is lacking, and for this reason, it was announced in July, 1918, that the plans for doubling the capacity of the Chile Exploration Copper Company were abandoned. Peru's 1916 increase over 1915 was nearly 21,000,000 pounds, but the Cerro-de-Pasco Copper Corporation, the largest mining company in Peru, is at present hampered by lack of ships and its production is decreasing. From Mexico, were conditions normal and a return possible to the same production as in 1912, more than 40,000,000 pounds increase could come, and this in spite of the fact that the 1916 production over 1915 was nearly 54,000,000 pounds. On the other hand, as Japan has been supple-

menting her own output since 1916 by refining brass coins imported from China, one firm having had a contract for two hundred thousand tons, it is doubtful if Japan can be counted on for much added production. Her increased yield from domestic ores in 1916 over 1915 was 13,000,000 pounds. Countries at a greater distance will hardly prove available for additional supplies in this crisis. But there is a price in excess of the price fixed in this country which it would pay us to offer for copper imported from neutral countries, and so procure the contribution of their labor and capital to satisfy our war needs. This result would justify a bounty for imports or even a charter bonus being given to neutral ships for this trade; or, best of all, our own Shipping Board might provide tonnage.

Increases of importance for our war needs are not now possible from discoveries, nor from recently developed mines. Even from many of the high cost producers the maximum production of 1916 cannot now be recovered unless a special price is made for their product. The normal process of copper mine development in the United States may be briefly summarized as follows: first, discovery and exploration by prospectors; second, development by an enlarged ownership — one of the smelting companies, or some group of men of wealth, taking a large portion, or even acquiring, not a part, but the whole, by purchase; and third, the offer of shares to the public on a speculative basis. In recent years, the successful mining companies, through exploration departments, or by actually creating exploration companies, have used their expert geological engineering staffs, and have examined hundreds of claims brought by the prospector who was welcome if his " specimens " and " showings " were interesting. In the prosperous years 1913 to 1916, the number of copper mines in the

United States increased from five hundred and sixty-three to ten hundred and eleven, or 79.6 per cent. The gain in this period, in the number of mines producing more than 1,000,000 pounds per annum was twenty-six, or 25 per cent. The risks attendant upon these developments are great, and the losses are so numerous that more and more such undertakings have gone forward only with the active aid and the financial help of the large companies. Not one of these, however, would now contract for such a development, and none would at any time accept for consideration an engineer's report that did not promise at least a 20 per cent profit. The Kennecott Copper Company in Alaska absorbed the Braden Copper Company in Chile, and made permanent its interest in copper production by large stock ownership in the Utah Copper Company. Anaconda Copper Company in Montana and its officers own very large interests in the Inspiration Copper Company of Arizona, the Green Cananea Copper Company of Mexico, and the Andes Copper Mining Company in South America. The Chile Exploration Company is controlled by the American Smelting and Refining Company group, while the large owners of Utah Copper have created "Ray" in Arizona and "Chino" in New Mexico.

With such risks to be ventured in the production of copper, and often only under these conditions of co-operation, the general assumption is credible that no price can be fixed at this time which will assure the necessary speculative rewards, subject to taxes, for the development of any considerable output from prospects and small mines. There should be as long as possible some margin of profit for the "going mines" in this classification, because the government in fixing a price to secure production in an essential industry assumes toward such properties a responsibility for at least pro-

viding the necessary price level to permit the continuance of the operations of these mines at a minimum cost essential to maintain their existence. Otherwise government action penalizes such companies by compelling them to run at a loss in order to save the capital invested together with some remnant of their organization. Special prices might well insure some continued output, and small supplies, therefore, may be expected from the nine hundred and fourteen mines which in 1916 produced about 50,000,000 pounds, or an average from each mine of approximately 50,000 pounds.

There were in 1916, ninety-seven copper mines producing more than 1,000,000 pounds a year; and of these the output of fifty-five was, for each, less than 5,000,000 pounds. As a unit of measure, each million pounds at a profit of ten cents a pound, without deduction for taxes, nets for a company $100,000. The output of the fifty-five mines probably averaged 2,000,000 pounds, so that this production, if ore in sight continued equal, and an amount for amortization charges were included in the costs, would allow for each mine $200,000 net income, subject to laws for taxation which do not yet take into account the peculiar risks and hazards of mining operations. For these properties, any balance after dividends and taxes will not provide much money for reinvestment in plant development. There remain, therefore, forty-two mines, each with an output of more than 5,000,000 pounds, from which comes more than 90 per cent of the gain in any one year's production. The variation in cost between these large producers over a series of years is about two cents a pound, and for the smaller from two to eight cents. Reasonable adjustments of existing contracts have already been made between the mines, the smelters and the refineries, and the capacity of the smelters and refineries at present re-

quires no increase in order to handle the domestic output and our foreign imports. The vital question, therefore, is what price fixed will afford the assurance necessary to induce these larger copper companies, some of which are high cost and some low cost producers, to increase to the utmost their developed as well as their yet undeveloped, but known, ore bodies? War is naturally a laggard in its industrial control, consuming accumulated supplies never intended for its use, and allowing production by so much and more to decrease, until essential industry is organized to obey its command for the development of all available sources. The spirit of war, whether its aims are conquest for a dominant place under the sun, or for human freedom and organized peace among the peoples upon the earth, consumes, until the issue is decided, all resources; and always the necessary next steps will be taken for the sake of national safety.

The industry at every stage of production faces high costs, with scarcity and inefficiency of labor cutting down seriously plant per unit output. The result, so far in 1918, is a probable further decrease in supplies of refined copper of 100,000,000 pounds. Since the first announcement of the government determined price, the shares of four of the largest producers have shown, as of July 1, 1918, a shrinkage of about $50,000,000. Present conditions and the excess profits tax do not encourage these larger copper companies to reinvest their earnings, or to raise new capital to increase plant output. In fact, if one were to assume a 5 per cent allowance for amortization and an 80 per cent excess profits tax, an increase of mining capacity at this time would mean for a going mine a waste of principal and of ore reserves, even if no account were taken of extravagant costs of new installations. As a copper mine is a liquidating asset, production and increases must net for its stockholders

profits somewhere near the normal average, considering the past and the future, as well as the life of the mine; otherwise the copper deposits will be left undisturbed and production will not increase. Steadily rising costs have thus their retarding effect. Even if a maximum price is once more named and allowed to continue, the industry, which because of government needs must increase its production, will nevertheless soon bring to the War Industries Board the questions of what reasonable mining profits are, and on what capitalization, depreciation, and amortization, the large producers can figure. Not until such questions have been answered can the industry itself be stabilized for purposes of maximum production, nor can the government know whether, under its coöperative control, it can secure through private companies adequate supplies. To this end it is a question whether the prices, first of 23½ cents, and now of 26 cents, have not accomplished all that is possible under existing conditions. The price can be again advanced as far as necessary to assure reasonable profits, but hardly far enough to secure adequate production. Detailed prices affecting different stages can be determined; or both a maximum and minimum price established for a definitely long period of time; or the possibility of speculative profits can be restored by providing that increased production above any one mine's best maximum shall be free from " excess profits " taxation during the war. Too much of uncertainty and too precarious a business risk even then exists, and especially so with judgment and action dependent upon the duration of the war, on present high costs, and on the possible changes in economic and social conditions after the war. There remains the possibility of government coöperation in enlarging at once the facilities of production in some of the mines of lowest cost per unit of man-

power, and in the end and only as a last resort, the actual commandeering of the mines. With the copper industry so highly centralized and also its large capitalized wealth, government control has so far proved easily effective. It has had to use only the compulsion of motives of self-interest, and yet on the producers' side it has been shown that more than this minimum response has been given. Since price-fixing began, the whole trade readjustment has been made with such exceptional smoothness, and has been withal so efficiently managed, that it will prove difficult, as well as a solution of doubtful expediency, to lessen the efficiency of the present established unity of control, especially if it is in any way to break up this complicated organization as already established.

Whatever may be the probabilities as to successive price determination in the future, and admitting that the increase over pre-war prices for copper has been 85 per cent as against larger increases in other products, the War Industries Board is, nevertheless, assured that the producers are giving their best and most loyal endeavor in spite of the uncertain economic conditions. Since our entry into the war no charge of profiteering has been justified against the copper industry, and government direction and coöperation have proved absolutely essential. Government price-fixing carries with it the responsibility for a system of distribution, the assurance to capital of a return, however temporarily reduced by taxation, and the prevention of strikes through adjustment of labor demands. Ultimately, the government must give its help in controlling high costs, so that an adequate production may be secured and victory won. For these ends our democratic government has found it necessary to delegate to its representatives, a few men chosen by the President, these great quasi-

judicial powers over the nation's industrial life, and while the Price-Fixing Committee has thus far exercised its authority only by fixing a maximum price for refined copper, its continued responsibility and the assured coöperation of patriotic endeavor within the industry will guarantee that the supply of copper shall not fail in meeting the war needs of our own government and of the Allies.

LEWIS KENNEDY MORSE.

AN ESTIMATE OF THE STANDARD OF LIVING IN CHINA

SUMMARY

I. Purpose: bearing on other investigations and an example of real economic pressure, 107. — II. Source of data: investigations made at Tsing Hua College, Peking, China, 108. — III. Limitations: an intensive survey of one district and not necessarily typical of the whole country, 110. — IV. Classes represented: Chinese and Manchu villagers, 112. — V. Tables: five tables classifying incomes, average amount expended for various purposes, per cent expended for various purposes, and sundry other items by expenditure groups, 118. — VI. Analysis of tables, 119. — VII. General conclusions, 122. — VIII. Comparison with other investigations: Engel, Mrs. More, Chapin, and the United States Bureau of Labor, 123. — IX. How it is done: the maintenance of a starvation standard, 124. — X. The cost, 127. — Figure I: a comparison of the extremes of variation in the percentage of expenditure for various purposes between the highest and the lowest income groups in five well known investigations, 123. — Figure II: a comparison of the percentage and average expenditures of 195 Chinese and Manchu families, 126.

I. PURPOSE

Two purposes are in mind in making the present study of family expenditures in a rural suburb of the city of Peking, China. The first is its bearing on other similar investigations made in this and in other countries and on the conclusions reached by Engel [1] in the fifties and modified by more recent students of the problem. The second is to present to the well-fed Oc-

[1] This study of family expenditures and the application of Engel's Law in a little district in North China is but a fragment of a larger study of the Standard of Living in China on which the writer has worked for some three years at Tsing Hua College (the American Indemnity College) in Peking, China, and to complete which he is returning to that place this year. Being but a chapter from a larger work, some phases of the problem will seem inadequately treated but this is because they are being more fully discussed in other connections.

cidental, who thinks he knows by experience what economic pressure is, a picture of real pressure as it exists in the Orient and an example of the limits to which a minimum plane of existence can be pushed.

II. Source of Data

The data here presented are gathered from an intensive study of the incomes and expenditures of one hundred and ninety-five Chinese and Manchu families and are supplemented with a study of the expenditures of ninety-three employees at Tsing Hua College. The one hundred and ninety-five families are scattered at random over the entire district surrounding the college which is located some five miles outside the west gate of the city of Peking. While many of them are farmers they are all villagers and come from more than a dozen different villages. The families of the employees studied are scattered over the entire province of Chili in which the city of Peking is located.

The investigation was made by the students of the college under the supervision of the Department of Social Science, a regular part of the course in Political Economy each year being a survey of this sort. It would be difficult to find a more carefully selected group of students than these who are gathered from every province in the country to be prepared for advanced study in America. These future leaders are keenly alert to China's social and economic problems and make, not only careful and efficient but sympathetic investigators, to work with whom has been a joy. From this source and from the work of a paid investigator, the following and other varied material has been accumulating since 1914 when the task was first undertaken. This investigator was a young man with a family who

lived the life of the people in one of the near-by villages. He understood their problems, for the standard of living he was investigating was the standard he was maintaining, but he spoke English and was much more intelligent, having been educated in a Mission College. The assistance of the Tu See, or Military Governor of the district, must also be acknowledged. This gentleman, being convinced of the sincerity of our effort, even went so far as to turn over to us the official records of his Yamen, or office. This consisted mainly of a census of the district made about 1912. It was translated by the students and proved a valuable source of information.

A partial list of the studies made during this time includes — a study of the living conditions in the villages of the district, a study of family budgets, a study of the budgets of servants and their families, a study of how the college servants spend their time, a social survey of the village of Chen Fu, and numerous population studies of the district.

In making this study a complete questionnaire was prepared, which was studied in detail by the students before being taken into the field. Here almost insurmountable difficulties were met but patience and perseverance rewarded us with a small number of reports, the trustworthiness of which we could be reasonably certain of. In order to obtain the one hundred and ninety-five cases here represented more than three hundred families were examined; and of more than two hundred reports of college employees, less than one hundred could be used. The reason for this large percentage of unreliability was the ignorance and suspicion of those investigated. As it was in no case possible for the ignorant villager to make out his own budget or even give very definite answers, and as he would have refused if he had realized what the investigator was about, the

cross-examination method had to be patiently and persistently used. Repeated visits had to be made and the investigator had to fill out his questionnaire from the fragmentary information he secured from time to time. This did not secure statistically exact information, but it did insure uniform and fairly accurate reports, provided the answers were not purposely misleading. That they were in so many cases evidently false and had to be discarded is amply explained by the healthy fear the native of this land of the bitter struggle normally has of any and of all outsiders who may be trying to exploit him. Even the college servants had to be officially assured that we had no ulterior motives in asking these questions.

Three years of experiment and weeding out makes us confident that the cases we have retained are representative and trustworthy. It has been our aim to err on the side of strictness rather than too great leniency. In some cases the evident crookedness of the individual investigated has led us to discard otherwise normal reports. In general, however, the discarded data were either incomplete or were so far from normal in some one or more expenditures as to make them obviously impossible. Here it has been necessary to rely very largely on the judgment of the Chinese investigators in discovering these errors.

III. Limitations

Only those who have lived in China can sympathize with the investigators in the difficulties encountered in making the present survey. Ignorance, superstition, fear, and even hate have worked against us. We have tried to use strictly scientific methods and to produce statistically correct results but at best we can claim no more for our results than that they are estimates which

we have so carefully studied, checked, and rechecked that we feel very sure of our ground. For this reason we are venturing to present them in statistical form, tho statistical accuracy in the sense that we know it from the studies of Dr. Chapin and Mrs. More has been, from the nature of the case, impossible. We venture also to compare these results with those obtained in Europe and America because they so clearly show the same general tendencies in spite of the tremendous difference in the standards of living.

It must be definitely understood that this is an intensive study of a particular district rather than an extensive study of the whole country. We cannot even be sure that it is a fairly representative plot. It represents the actual living conditions in a little district of less than seven square miles to the northwest of the capital. It is called the First Division of the Western Suburb, and in these few square miles is supported a population of more than eight thousand people. There are eighteen villages, and more than three square miles are occupied by the deserted gardens of princes and the famous, now ruined, palace of Emperor Chen Lung. This give us a density of population scarcely equaled in many of our smaller American cities.

The individual character of the problem is complicated by the fact that the district is largely occupied by the now destitute Manchus who formerly lived here in opulence and ease on the tribute money exacted from the conquered Chinese. Today the Chinese are masters, and all outside income has ceased with the exception of a small pension doled out to them by the deposed imperial family. Their condition in this period of transition and the provision which will have to be made for their future constitute one of China's foremost social

Whether or not these data are typical of the Orient or even of China only time and other similar studies can tell. The Chinese associated with me in the work feel that they are very exceptional and that other parts of the country will make a better showing, but American friends from the south of China are under the impression that that section of the country will register an even severer economic and population pressure.

Therefore we are justified in taking this study only for what it is: a statistical estimate of the standard of living actually obtaining in a small district some five miles outside the capital of the Chinese Republic.

IV. The Classes Represented

Three distinct classes of people are studied in the following tables only three of which can be combined and these not with entire satisfaction. Their value lies, however, not in our ability to sum them up in one table but the manner in which they complement each other. Each very definitely shows precisely the same main tendencies. As the studies of these classes were made independently and at different times, this constitutes the strongest single proof of their reliability.

The one hundred and ninety-five families in Tables II and III are divided into Chinese and Manchus. The different characteristics of the two peoples, the difference in their standards and morality, and the difference in their industry and source of income, make these two tables of value for purposes of comparison but difficult to combine. We find that within the same expenditure group the relative importance of the same item of expenditure varies greatly. The Chinese have no cases in the lowest expenditure group and the Manchus have no cases in the highest. For this reason

it has seemed best to omit all data in these two groups, in the final table combining the entire one hundred and ninety-five cases.

The families represented have been taken at random from the whole district. They represent farmers, mechanics, tradesmen, day laborers, drivers, carpenters, barbers, and in fact all classes from beggars to gentle folk. No attempt has been made to choose one class or one level. Any case presented, no matter what the class or status, has been retained if trustworthy.[1]

The servants (Tables IV and V) represent a class by themselves and are of only supplementary value to the study. They have regular incomes and are furnished with housing and light and fuel. They can get good food (according to their standards) at a minimum cost, and they regularly send a large proportion of their incomes home to their families in case they depend on them for support. Such budgets cannot, of course, be compared with the above general family budgets.[2]

V. The Tables

Table I compares the distribution of Chinese and Manchu incomes. The median in each case falls in the $90–$109 group, but the Manchu has a larger number in the lower income groups and the Chinese in the higher.

A still more important fact is that 75 per cent of the income of the Manchu family is derived from the pension and the house which is given with it. Only 13

[1] Approximately one-third of the men represented in the families investigated are men with trades, one-third are farmers, one-sixth are small dealers, and one-sixth are common laborers.

[2] In another study of the expenditures of college employees they were found to have an average income of $93.71 of which an average amount of $39.91 was sent home to their families. Of the families of servants 63 per cent earned by their own efforts less than the amount sent home to them and 31 per cent earned nothing at all.

of the remaining 25 per cent comes directly from an occupation. In the entire district where there are more Chinese than Manchus two hundred and eighty-five Manchus are reported as without occupation as against ninety-one Chinese. The Manchu does not like to work. He has been known to pull up the brick tiles of his floor

TABLE I. A COMPARISON OF THE INCOMES OF CHINESE AND MANCHU FAMILIES

Income in Chinese Dollars	One Hundred Chinese Families	Ninety-five Manchu Families
30– 49	0	9
50– 69	11	15
70– 89	14	21
90–109	26	24
110–129	15	12
130–149	13	11
150–169	8	3
170–189	2	0
190–209	5	0
210–229	2	0
230–249	3	0
250–269	1	0

and sell them first. In one village of some forty families three-quarters of the homes were thrown open to the soldiers of the near-by barracks and a thriving business in prostitution was done. Children are an economic asset. This is a striking indication of the Manchu problem. The Chinese living and working in the same district have no pension and yet are in much better economic condition and live happier and more useful lives.

A comparison of the distribution of expenditures (see Table II) shows the same tendency. For Chinese the median expenditure group is $90–$109 while for Manchus it is $70–$89.

Tables II and III show respectively the percentage and the average expenditures for various purposes of one hundred and ninety-five Chinese and Manchu families. For purposes of comparison the one hundred Chinese and the ninety-five Manchu families are treated both separately and collectively. In addition the average income, average expenditure, average surplus and deficit, and average size of the family are shown for each group.

Correlation is according to expenditure rather than income. Seven $20 classes are used, beginning at $30 and ending with $150 or over. Reducing this to American money the range would be from $15 to $75 and over. Investigations made in this country generally use a range of from $200 to $1500. A comparison of the two shows a gulf which cannot be accounted for by the greater purchasing power of the dollar in China nor yet by the fact that most American investigations have been made among city dwellers while this is a rural community. Making allowance for every difference of this sort we still have a discrepancy for which it is possible to account only by the great difference in the standard of living.

In none of these tables has the attempt been made to reduce Chinese to American money owing to the constantly fluctuating exchange between the two countries and the difference between the *real* value of the two dollars. The writer has seen the American dollar fluctuate more than one hundred points in value in the space of a single year in China. For the five years ending January, 1916, the average value of the American dollar in Chinese dollars was a fraction less than $2.25. In general, however, where the actual exchange of money is not concerned, it is customary to figure on an exchange of two for one.

TABLE II. EXPENDITURES OF ONE HUNDRED AND NINETY-FIVE CHINESE AND MANCHU FAMILIES

Expenditure Groups by $20 Classes	Size of Family	No. of Cases	Per cent Deficit or Surplus of Total Income	Per cent Total Expenditure of Total Income	Per cent of Total Expenditure				
					Food	Clothing	Light and Fuel	Rent	Miscellaneous
ONE HUNDRED CHINESE FAMILIES									
$20-$40	..	..	..	..	..	..	..	..	..
40- 60	2.5	11	..	100.0	76.9	5.1	7.6	9.0	1.4
70- 90	3.2	14	2.3	97.7	80.3	4.3	5.6	7.9	1.9
90-100	4.2	22	2.2	97.8	78.0	5.9	5.8	8.0	2.3
110-120	4.3	12	1.7	98.3	72.7	9.0	7.5	7.6	3.1
120-140	4.5	14	3.8	96.2	72.4	8.9	7.3	7.3	4.1
140 Over	5.0	17	2.4	97.6	72.0	9.8	5.7	6.8	5.6
NINETY-FIVE MANCHU FAMILIES									
$20-$40	2.5	8	− 4.5	104.5	82.0	.6	4.5	13.0	..
40- 60	4.5	9	− 3.7	103.7	82.0	1.3	4.1	11.3	1.3
70- 90	4.4	30	− 2.5	102.5	77.0	4.4	4.9	10.2	3.5
90-100	4.8	26	2.3	97.7	72.5	5.5	7.0	8.8	6.2
110-120	4.1	12	6.6	93.4	68.6	8.5	6.9	7.2	8.8
120-140	6.1	10	1.2	98.8	68.5	7.9	6.7	7.0	9.9
140 Over	..	..	..	..	..	..	..	..	..
TOTAL OF ONE HUNDRED AND NINETY-FIVE CHINESE AND MANCHU FAMILIES									
$20-$40	2.5	8	4.0	104.0	..	..	..	..	..
40- 60	3.4	20	1.5	101.5	79.0	3.4	6.0	9.9	1.3
70- 90	4.0	44	.3	100.3	77.9	4.4	5.1	9.4	3.0
90-100	4.4	58	2.3	97.3	75.2	5.6	6.3	8.4	4.0
110-120	4.2	24	4.0	96.0	70.5	8.7	7.2	7.5	5.9
120-140	5.1	24	3.0	97.0	70.8	8.5	7.0	7.1	6.6
140 Over	5.0	17	2.4	97.6	..	..	..	..	..

Expenditure Groups by $20 Classes	Average Total Income	Average Deficit or Surplus	Average Total Expenditure	Average Expenditure for				
				Food	Clothing	Light and Fuel	Rent	Miscellaneous
ONE HUNDRED CHINESE FAMILIES								
$30–$49	....	....	....	....	....	....	....	....
50– 69	$59.0	....	$59.0	$45.3	$3.0	$4.5	$5.3	$ .8
70– 89	78.5	$1.8	76.7	61.5	3.3	4.3	6.1	1.5
90–109	100.2	3.2	97.0	75.7	5.7	5.6	7.8	2.1
110–129	119.8	2.1	117.7	85.6	10.6	8.8	9.0	3.7
130–149	138.8	5.3	133.8	96.9	12.0	9.8	9.8	5.5
150 Over	188.8	4.5	184.1	132.4	18.0	10.5	12.4	10.2
NINETY-FIVE MANCHU FAMILIES								
$30–$49	$40.1	– $1.6	$41.8	$34.2	$ .3	$1.9	$5.4	....
50– 69	57.6	– 2.2	59.8	49.1	.8	2.4	6.6	$ .8
70– 89	74.8	– 1.8	76.6	58.9	3.4	3.8	7.8	2.7
90–109	101.5	2.4	99.1	71.8	5.5	6.9	8.7	6.1
110–129	126.2	8.0	118.2	81.1	10.0	8.1	8.5	10.4
130–149	139.5	1.7	137.8	94.5	10.9	9.2	9.6	13.6
150 Over	....	....	....	....	....	....	....	....
TOTAL OF ONE HUNDRED AND NINETY-FIVE CHINESE AND MANCHU FAMILIES								
$30–$49	$40.1	– $1.6	$41.8	....	....	....	....	....
50– 69	58.5	– .9	59.4	$47.0	$2.0	$3.6	$5.9	$ .8
70– 89	76.0	– .6	76.6	59.7	3.4	3.9	7.2	2.3
90–109	100.8	2.8	97.9	74.0	5.5	6.2	8.2	3.9
110–129	123.0	5.0	118.0	83.3	10.3	8.5	8.8	7.0
130–149	139.7	4.2	135.5	95.5	11.5	9.5	9.7	8.9
150 Over	188.8	4.5	184.1	....	....	....	....	....

Expenditures are classified under the usual five heads — food, clothing, light and fuel, rent, and miscellaneous. Under the first four are included all subsistence wants while under the last must be included that indefinite, always growing, ever insistent class of needs amongst which are education, books, travel, recreation, social obligations, medical attendance, insurance, spending

TABLE IV. EXPENDITURES OF NINETY-THREE SERVANTS

Expenditure Groups by $20 Classes	No. of Cases	% of Total sent Home	% of Total spent on Self	Per cent of Total Expenditure on Self for			
				Food	Clothing	Other Necessities	Miscellaneous
$30–$49	7	4.5	95.5	84.7	13.2	1.4	.7
50– 69	13	25.0	75.0	76.0	19.8	2.0	1.2
70– 89	12	36.0	64.0	70.0	22.2	3.0	2.5
90–109	51	47.0	53.0	69.5	18.5	8.7	3.6
110–129	10	53.5	46.5	63.0	21.0	10.8	6.1
130–149	..	..	..	..	..	..	..
150 Over	..	..	..	..	..	..	..

money, et cetera. It is a nice little problem to estimate what per cent of the total expenditure can be devoted to each of the above when less than a dollar a year is available for miscellaneous expenditures. The results here shown make it evident that the standard of living is to be measured not by the per cent of the income spent for food but by the per cent remaining for these miscellaneous purposes after the mere subsistence wants have been satisfied. In neither Mrs. More's nor Dr. Chapin's studies do we find the per cent of expenditure for food decreasing regularly as the income increases. The irregularity in the case of Dr. Chapin's study is hard to explain. In neither of the above two cases would it be possible to use this per cent as an index.

In Tables IV and V the expenditures for servants are presented in the same general manner as for Chinese

and Manchu families in Tables II and III. Owing to the different conditions obtaining, as indicated above, the purposes of expenditure are slightly different. The general expenditure is divided into the amount sent home and the amount spent on self. Expenditures on self are divided into food, clothing, other necessities, and luxuries. The same expenditure groups are used.

TABLE V. AVERAGE EXPENDITURES OF NINETY-THREE SERVANTS

Expenditure Groups by $20 Classes	Average Total Income	Average Am't sent Home	Spent on Self				
			Total	Food	Clothing	Other Necessities	Miscellaneous
$30–$49	$44.5	$ .3	$42.5	$36.0	$5.5	$ .6	$ .3
50– 69	61.0	15.5	45.5	35.0	9.0	.9	.5
70– 89	81.0	29.0	52.0	36.5	11.6	1.6	1.3
90–109	99.0	46.0	53.0	36.7	9.8	4.6	1.9
110–129	117.5	63.3	54.2	34.0	11.2	5.5	3.3
130–149	..	..	..	..	..	..	..
150 Over	..	..	..	..	..	..	..

VI. ANALYSIS OF TABLES

Surplus and deficit. All Manchu families show a deficit till an expenditure of $90 is reached. The record for Chinese is much better, as in even the lowest expenditure group there is no deficit and at $70 they begin to save. Deficits go as high as 4 per cent and, omitting one group which is very exceptional, the surplus attains the same per cent.

Food. The average expenditure for food increases as the general expenditure increases, but not proportionally, for the per cent decreases. This is regularly demonstrated by the Manchus and Chinese, separately and together, and by the servants. The per cent expended for food varies from a maximum of 83 per cent for Manchus in the lowest expenditure group to a minimum of 68 per cent for the same people in their

highest expenditure group. The minimum average expenditure is $34.20 per year for an average family of 2.5 Manchus, and the maximum is an average of $132.40 for a family of 4.5 Chinese. The average expenditure for food for servants remains in all groups very close to $36 which is the regular cost of board for servants at the school.

The interesting thing to note here is that we have a wider range of variation among the Manchus than among the Chinese in the per cent spent on food. The reason is that the thrifty Chinese are less willing to cut down on food for the sake of luxuries than are their former masters, the Manchus. This tendency we shall see again.

Clothing. In every case the average amount and the per cent spent for clothing show a marked tendency to increase. The per cent spent on clothing varies from .7 per cent to 9.8 per cent and the average amount varies from $.30 to $18. The Chinese spend both a larger per cent and a larger average amount than do the Manchus on this item. Here is another place where the Manchus can cut down in order to get the luxuries he once was used to. The servants, due to the character of their work spend a relatively large amount on clothing.

Light and fuel. The average amount spent on light and fuel shows a marked tendency to increase and the per cent shows a slight tendency in the same direction. In other investigations the per cent for this item either decreases or remains the same. The reason for this difference lies in the fact that, until an expenditure of $90 is reached for both Chinese and Manchus, the family cannot spend a sufficient amount for this purpose and has to make up by gathering fuel from the fields. Six dollars is the minimum amount with which a family can do, and to spend more than $10 means luxury. A

quarter of the Chinese and nearly half of the Manchus spend less than $5 for light and fuel. For servants these things are furnished.

Rent. Rent in this district is comparatively low. It ranges from $5 to $12 per year, and amounts to from 5 per cent to 12 per cent of the total expenditure. The best house in the district can be rented for $15 and would be fairly comfortable as a shelter for stock.

Servants are housed at the college.

Miscellaneous. The average amount available for miscellaneous expenditures ranges from nothing for Manchu families of the lowest class to a maximum of $13.60 for the same people in their highest class. The range for Chinese is much more modest. Their lowest class has $1.40 and their highest has $5.60. We have already seen the reason for this lies in the willingness of the Manchu to cut down on necessities in order to save for this item.

Luxuries combined with "other necessities" for servants show them to spend a larger proportion of their incomes for this purpose than the above families do. Probably coming in contact with a higher standard of living in their work is responsible for this.

Average amount sent home. Among the servants the big item is the amount sent home to the families dependent on them. The average amount spent on self varies from $42.50 to $55, but the average amount sent home varies from less than $1.00 to $63.30. Living among them has been largely standardized, which accounts for this large surplus.

VII. General Conclusions

Four general conclusions may be reached from the study of the foregoing tables.

1. As the general expenditure increases, the average size of the family is larger.

2. As the general expenditure increases, the average amount spent for food and for rent increases but the per cent shows a regular and definite tendency to decrease.

3. As the general expenditure increases, both the average amount and the per cent spent for clothing and miscellaneous items show a regular and a definite tendency to increase.

4. As the general expenditure increases, the average amount spent for light and fuel increases perceptibly but the per cent shows only a slight tendency in the same direction.

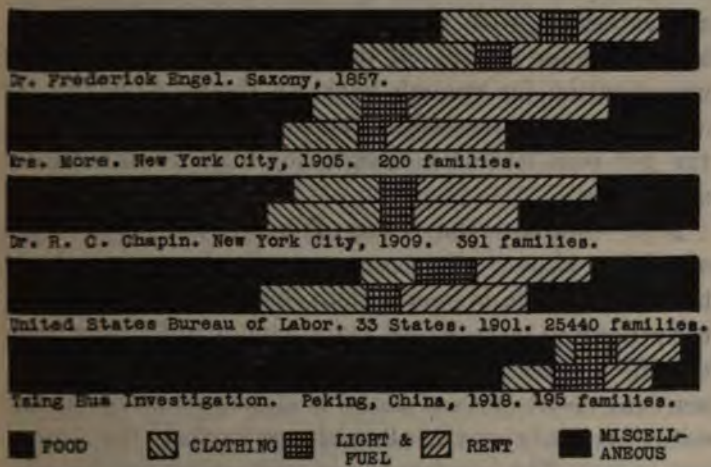
The above conclusions vary from those reached by Engel in the same manner that the American investigations have varied. They hold for food and luxuries (miscellaneous) but not for the rest. As in America the per cent spent for clothing increases and the per cent spent for rent decreases. In China, however, the per cent spent on light and fuel shows a slight tendency to increase while in America it decreases. This is explained by the fact already mentioned that many families in the survey gather from the fields half the fuel they consume, and some of them, most of it. This accounts for the rapid increase in the average expenditure for light and fuel as the family income becomes large enough to relieve the family of this burden.

VIII. Comparison with other Investigations

Figure I is a comparison of our investigation with four other investigations of the subject. The purpose of the

FIGURE I

A COMPARISON OF THE EXTREMES OF VARIATION IN THE PERCENTAGE OF EXPENDITURE FOR VARIOUS PURPOSES BETWEEN THE HIGHEST AND THE LOWEST INCOME GROUPS IN FIVE INVESTIGATIONS[1]


Dr. Frederick Engel. Saxony, 1857.
Mrs. More. New York City, 1905. 200 families.
Dr. R. C. Chapin. New York City, 1909. 391 families.
United States Bureau of Labor. 33 States. 1901. 25440 families.
Tsing Hua Investigation. Peking, China, 1918. 195 families.
FOOD
CLOTHING
LIGHT & FUEL
RENT
MISCELLANEOUS

[1] The Expenditures in Five Investigations

Investigation	Income Groups A — Lowest B — Highest	Per cent of Total Expenditure				
		Food	Clothing	Light and Fuel	Rent	Miscellaneous
Engel ..... A	$225- 300	62.0	16.0	5.0	12.0	5.0
B	750-1000	50.0	18.0	5.0	12.0	15.0
Mrs. More ..... A	200- 400	44.2	7.3	6.5	30.5	11.5
B	1200-1500	39.5	11.3	4.5	18.0	26.7
Dr. Chapin ..... A	400- 499	40.8	13.0	5.6	26.8	14.8
B	1500-1599	36.8	16.8	4.1	16.3	26.0
U. S. B. of L ..... A	Under 200	50.9	8.7	7.9	16.9	15.6
B	1200 Over	36.5	15.7	5.0	17.4	25.4
Tsing Hua ..... A	30- 49(a)	79.0	3.4	6.0	9.9	1.3
B	130- 149	70.8	8.5	7.0	7.1	6.6

(a) Chinese dollars. Exchange value fluctuates greatly but is normally about $.50.

comparison is to show the range of variation within and between them. In each case the lowest and the highest income groups are contrasted. The three American studies do not vary greatly. In general, the three belong to the same class and show the same general characteristics. Engel's study varies mainly in that a larger per cent is spent for food and a smaller per cent remains for miscellaneous expenditures. A similar study made in Massachusetts in 1885 shows the same characteristic, with 64 per cent spent for food in the lowest income group. If it were possible to push this investigation far enough back we should find the per cent spent on necessities constantly increasing and the per cent left as a margin for luxuries constantly decreasing.

Now compare the Tsing Hua results with those obtaining above. In every case the best record obtained for China is poorer than the poorest recorded in the other four, even Engel's study made in Prussia more than fifty years ago and the one made here in 1885. The per cent spent on food alone is almost as much as the entire per cent spent on all existence wants in the American cases. The maximum per cent remaining for miscellaneous expenditures in China is 6.6 per cent while, in America the lowest is nearly twice that amount. Many of the families in our investigation reported that the mere buying of the most pressing necessities of life thrust them into debt.

The comparison in this figure shows vividly what is meant by a minimum plane of existence.

IX. How it is Done

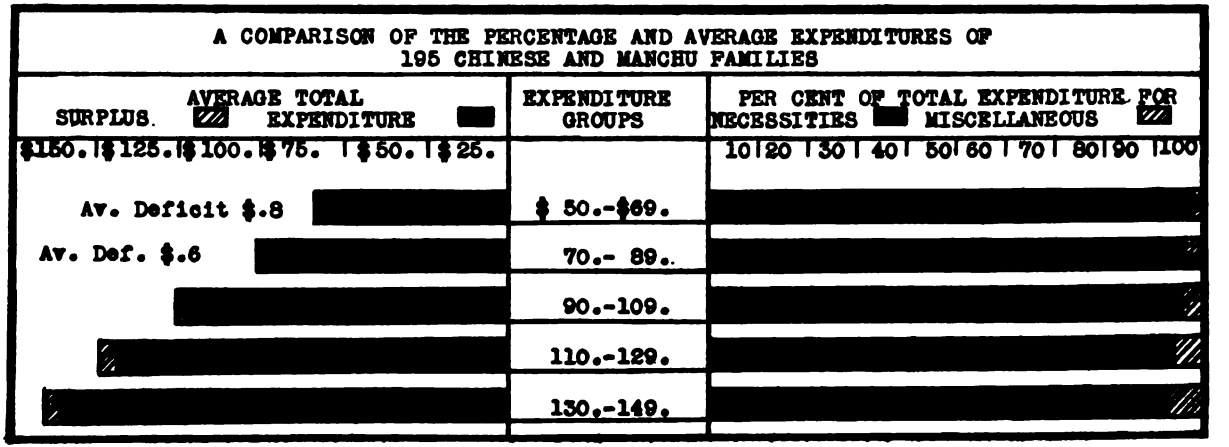
In America a family which spends half its income on food and has less than one-fifth of it left for miscellaneous expenditures is thought to be in a very bad way,

but this is better than the best that our present study can show. In the investigation we have individual cases where as high as 90 per cent is spent for food and a larger number in which tea and meat, if they could be afforded at all, would come under the head of luxuries. How does a family of 2.5 feed itself on even 83 per cent of an income of $40 per year. The answer is that two meals of corn bread and salted turnips per day with plenty of good hot water to help it down would cost very little in America and costs much less than half as much in China. I must add, however, that, low as the standard is, I have never seen any evidence of the eating of dog flesh, rats, or any food of that sort.

The same family spends the sum of thirty cents per year on clothing. Of course this is fictitious accuracy but it shows very well the condition to which they are reduced. The acquisition of clothing is purely a matter of happy accident. In summer their clothing, tho dirty, is comfortable for it is well ventilated. In winter they suffer. Cotton is worn, single in summer and thickly padded in winter. Plenty of it is comfortably warm but people of the lowest groups have but a single suit, the cotton wadding being taken out when it is warm and replaced when the cold weather comes on.

If it takes $6 to keep a family from freezing to death in this cold North China climate, and if half the families spend less, where does fuel come from ? This is answered any day during the fall and winter by the swarms of old women and children who infest the fields and highway picking up sticks, throwing clubs into the branches to break off twigs, gathering stubble from the fields, and even collecting the dry grass and leaves with a bamboo rake and basket. We have a saying in China that the whole country is raked with a fine toothed comb each year.

FIGURE II


A COMPARISON OF THE PERCENTAGE AND AVERAGE EXPENDITURES OF 195 CHINESE AND MANCHU FAMILIES
SURPLUS.
AVERAGE TOTAL EXPENDITURE
EXPENDITURE GROUPS
PER CENT OF TOTAL EXPENDITURE FOR NECESSITIES
MISCELLANEOUS
$150. $125. $100. $75. $50. $25.
10 20 30 40 50 60 70 80 90 100
Av. Deficit $.8
$ 50.-$69.
Av. Def. $.6
70.- 89.
90.-109.
110.-129.
130.-149.

How can rents be so low? What sort of a house can one rent for $10 per year? Well, dirt floors are not expensive, thatch lasts a long time and, even if it does leak, rain does not always fall, and modern sanitary conveniences such as a screen of reeds, a hole in the ground, and an open gutter running to a hole in the wall and emptying into the road are not hard to install.

Now what does this family do for education, books, travel, recreation, social obligations, et cetera? What insurance do they carry and how much is laid aside for the rainy day? What would happen if sickness came? These questions are unanswered for us as they are for the native of this district. If sickness comes it means suffering and perhaps death. If the rainy day comes it means suffering and perhaps the same end. They can have all the luxuries, advantages, and insurance that from nothing to $15 per year can offer.

X. What is the Cost?

From the study of a large number of cases it appears that a family of five can live in comparative comfort (according to local standards) on $100 per year. This means that they can have enough food, tho simple and poor, live in a house which will at least shelter them from the elements, have at least two suits of clothes, have enough fuel so that they do not have to go out and gather it, and have five dollars left over for miscellaneous expenses which will give them meat on feast days and tea quite often, almost every week; while if there is no sickness, they may even make a trip to the temple fair back in the mountains.

What a picture of the struggle for existence! These people do get along, and the above family is happy and will consider itself fortunate to come out so well; but

what is the price they pay? Among people of this class life presents such a hard front that the struggle for existence cripples intellectual and spiritual growth even as it does physical development. Healthy virile amusements as the Westerner knows them are conspicuous for their absence. Efficiency and intellectual alertness are at the minimum and nervous reactions are slow. There is no surplus of energy because it is all used up in meeting the hard conditions which make mere survival a difficult matter. Ignorance, over-reproduction, congestion, low position of woman, lack of sanitation, epidemics, and a tremendous loss of "potential ability" — this is the price they pay.

C. G. DITTMER.

MADISON, WIS.

RAILWAY SERVICE AND REGULATION

SUMMARY

War as emphasising inadequacy of transportation facilities, 129. — Extra burdens upon transportation due to the war, 130. — History, extent and consequences of insufficient transportation facilities in the United States, 133. — Statistics of car shortage since 1907, 135. — Reasons for inadequate transportation facilities, 143. — Traffic conditions compared with expansion of railway plant, 143. — Duty of railroads to furnish adequate equipment, 145. — Popular misconception of car shortage, 146. — Aggregate supply of railroad equipment sufficient in most years, 149. — Relation of railroads to each other in exchange and interchange of cars; recent disregard of car service rules; unfortunate results of the historical relations of shipper and railroad, 150. — Early facilities in excess of needs, 153. — Significance of increase in number of commission and middle men, 157. — Position of Interstate Commerce Commission on reconsignment, 159. — Responsibility of government regulation, 161. — Importance of adequate return upon investment and transportation facilities, 161. — Necessity for extension of federal authority over railway service, 166. — Esch-Pomerene law only a beginning, 167. — Comprehensive control of railway service necessary even with continuation of government operation or adoption of government ownership, 170.

THE world war with its abnormal demands upon the railways of this country has strikingly emphasized the inadequacy of our transportation system. The extra burden thus thrown upon the railroads has been due, among other things, to a larger amount of traffic, a falling off of water-borne tonnage, and unusual labor conditions. In the first five months after a state of war was declared to exist between this country and Germany, the railroads handled more freight tonnage than in any whole year previous to 1904.[1] On 51 per cent of the railroad mileage of the United States in the summer of

[1] Railroads' War Board, Official Information No. 18, November 27, 1917.

1917, there was an increase of 16 per cent, or 3,354,000,000 ton miles in one month. This was equivalent to adding 35,000 miles of railroad to that of the United States, with an average density of freight traffic on each mile equal to the average density of all railroads in the United States in 1915. This virtual addition to the fixed plant of American Railroads nearly equaled the total railway mileage of Germany in 1913 and exceeded that of Great Britain in 1914.[1] In the last annual report of the Pennsylvania Railroad Company,[2] it is claimed that the ton mileage of that system for the year 1917 exceeded by over 60 per cent the combined annual ton mileage before the war of all of the railroads in Great Britain and France.

That less water-borne traffic has been responsible for a part of this marked increase in rail traffic may be seen from the fact that vessels, not only from the Great Lakes but from our intercoastal trade, have turned to the more profitable ocean carrying trade. This shift is reflected in the percentage of our exports and imports which have been carried in American vessels since the war began. In the fiscal year 1914, this percentage was 9.7; in 1917, it was 18.6.[3] In the fiscal year 1915, there was a total of 335 vessels with 1,846,658 tons cargo in the coastwise trade from the Atlantic to the Pacific and *vice versa*. In the first half of the fiscal year 1917, there were but eighteen vessels with a tonnage of 97,363.[4] From testimony before the Newlands Committee, it appears that prior to the autumn of 1915 there never had been

[1] Railroads' War Board, Official Information No. 8, July 7, 1917.

[2] Seventy-first Annual Report (1917), p. 7.

[3] The figures from 1914 to 1917 (fiscal years) are as follows: 1914, 9.7; 1915, 14.3; 1916, 16.3; 1917, 18.6. Annual Report, Commissioner of Navigation, 1917, p. 101.

[4] Panama Canal Record, vol. x, p. 464. See also statement of Julius Kruttschnitt in hearings before the Committee on Interstate Commerce, U. S. Senate, 65th Congress, 2nd Session, pursuant to S. Res. 171, pp. 196, 197; hereafter referred to as Hearings on Government Control.

a record of a carload of grain moving from Oregon or Washington over the Union Pacific to the Atlantic Seaboard; that since that time, many thousand of carloads had been sent overland on that and other railways to Atlantic ports.[1]

Conditions in the labor market as a result of the war have made it difficult for railroads to maintain their former standards of efficiency. Losses of employees have been due to withdrawals to enter military service, as well as to enter industrial fields offering distinct advances in wages or salary. Consequently, the loss has not been confined to any one class. In December, 1917, the Railroads' War Board stated that the railroads generally were short-handed; that at that time some carriers reported a net shortage of 12½ per cent in the number of laborers, and a much larger percentage of loss in efficiency because of the necessity of filling vacancies with unskilled and inexperienced men.[2] In some engine houses the railroads were reported to be employing men who did not know the difference between a monkey wrench and a fire hook.[3] The effect of the loss in the lower tier of labor has been the more serious in view of the conditions which have affected immigration. Furthermore, unskilled laborers once secured by the railroads are constantly shifting to positions with industrial concerns, once they have learned of such possibilities. This has been true of large numbers of negroes that have been brought into northern states.[4] The last annual report of the Pennsylvania Railroad shows that that company hired 278,000 persons from all parts of

[1] Testimony of Judge Lovett in Hearings before the Joint Committee on Interstate and Foreign Commerce, 65th Congress, 2nd Session, pp. 772–775; hereafter referred to as Newland's Hearings. See also statement by Commissioner Hall in Hearings on Government Control, pp. 46–47

[2] Railroads' War Board, Official Information No. 19, December 5, 1917.

[3] Railway Age, December 14, 1917, p. 1082.

[4] Traffic World, November 18, 1916, p. 1008.

the country and distributed them over its system.[1] This is at least four times as many men as were usually hired in order to keep up its force.[2] All this has meant less efficient transportation service and a deterioration in the railway plant. Locomotives have been used longer before sending them in for repairs because of the heavy traffic to be moved; once in the shop, they have received less efficient repairing, and have limped out only to return and repeat the process. Little wonder there should have been such a locomotive shortage during the severe winter of 1917–18.[3]

These features of the transportation situation have been of sufficient importance to account for the inability of the carriers to meet the demands made upon them in the last two years. There is danger, therefore, that the war will receive much more consideration than it deserves as a direct cause of the inadequacy of our transportation facilities. The items above mentioned have received much attention in the press, while other less conspicuous but more fundamental factors, because more permanent, have not received the serious con-

[1] Annual Report, 1917, p. 5. President Rea observed, "The employment and training of these men was costly and seriously hampered operations, because many of them remained only a short time in the service." Ibid., loc. cit.

[2] The Railway Age, March 8, 1918, p. 490, states the number of new men hired by the Pennsylvania Railroad in 1917 as 177,000, and says "This is at least four times the number of men that had been taken on new in any previous year."

"The railways of the United States engaged in Interstate Commerce employ about 1,800,000 persons. If we include interurban and street railways, the number is increased to over two million. Now conceive, if you will, a great map of the United States on which each of these employees is represented by a tiny electric light. Some are moving along the familiar tangled lines indicating railway systems, but the greater number are stationary and grouped about the large terminals. Everywhere lights are being extinguished, sometimes by death, more often by the resignation or discharge of an employee; and everywhere new lights are appearing as new employees are hired. Five times a minute, 300 times an hour, 7200 times a day, employees are being lost and replaced. These figures are assumptions only, but they are conservative and probably far below the facts." From an article, "Mobilizing Intelligence on American Railroads," by Norman Collyer of the Southern Pacific Railway, in Railway Age, February 22, 1918, pp. 419–421.

[3] See ibid., April 5, 1918, pp. 907, 908. Both the lack of men to do repair work and the character of the repair work done are reflected in the 1917 report of the Inspector of Locomotives to the Interstate Commerce Commission.

sideration to which they are entitled. Furthermore, in our regulation of railways in normal times, the charge which should be made for service has been emphasized. The character of the service itself has received too little attention.[1] It is therefore pertinent to inquire to what extent the transportation facilities of this country were inadequate even before the world war; to try to discover the causes for this condition of affairs; to examine the consequences of such inadequacy; and, finally, to suggest wherein our regulation and control of railways in future should give more attention to the sufficiency and efficiency of the service. Such a study of our transportation system is of value whether, as a result of the war, we have government ownership, or whether the roads be returned to their owners.

The extent to which the American transportation system has failed at times in the past to meet the demands made upon it, is very difficult to measure. Statistics of so-called car shortage register in a general way the inability of the railroads to move traffic which is offered to them; but, as will appear later, the popular view is narrow in assuming that the inability of carriers to meet the demands made upon them is necessarily due to a shortage of equipment. In January, 1907, the American Railway Association began the publication of statistics of car shortage.[2] Table I (Appendix, p. 175,

[1] See statement of Commissioner McChord, before National Association Railway Commissioners. Proceedings, 1908, p. 15.

[2] Fifty of the largest companies were chosen and asked to give facts concerning car shortages and car surpluses. The first report was made on January 2, 1907; the second on February 6, 1908. By that time the committee was so discouraged by the large car shortage that they did not make up another report until April, 1908. Then the American Railway Association met and instructed the committee to secure statistics every two weeks. These instructions were carried out after that with the exception of the period from October 15 to February 1, 1915, when the car surplusage was so great and railroad depression so marked that the American Railway Association temporarily discontinued the compilation as a matter of economy. After February 1, 1915, the statistics were compiled once each month by the Association. The U. S. Railroad Admin-

infra) gives these statistics from January 2, 1907, through 1917.[1] This table indicates the ability of the railroads to furnish equipment in various years and during certain seasons of the year. It will be observed from the column marked "Net Shortage" that conditions were acute in January and February of 1907; that the net shortage disappeared in July, 1907, and appeared again in September of that year and continued until the latter part of November. No net shortage appeared again until November of 1909, and then only to a minor extent. Not until the fall and winter of 1912 was there another net shortage, which was only a little less severe than that of the corresponding period of 1907, but it continued somewhat longer than in 1907. With the exception of a slight scarcity for about a month in the fall of 1913, no further net shortage appeared until the first of March, 1916. This continued for that month only; but was followed by another shortage beginning in September, which has continued since with varying degrees of intensity.

Examination of Table I and Chart I (based on data in Table I) shows that it is unusual for any car shortage to occur in the spring months and that it is heaviest during the autumn. The figures show that in April, 1908, there was a surplus of equipment of 413,338 cars; that from November, 1913, to March, 1916, there was a continuous surplus of equipment, the number reaching 200,000 even in the month of October, 1914, when the American Railway Association as an economy measure discontinued its statistics. When the Association resumed the col-

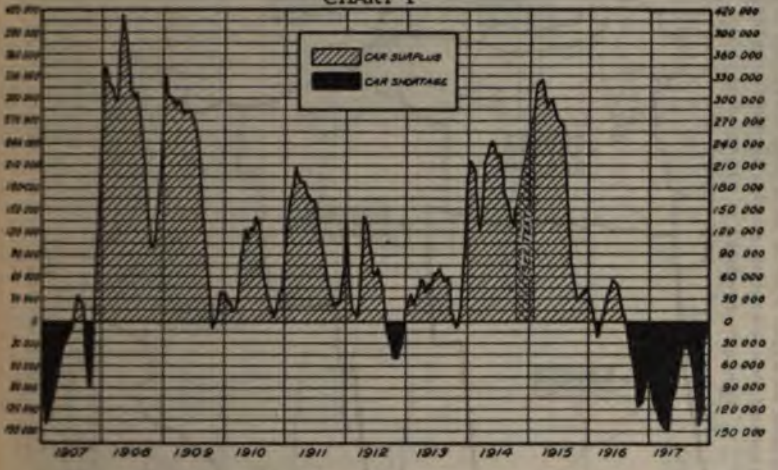
istration has not continued these statistics. See Proceedings National Association Railway Commissioners, 1908, p. 43. The figures in Table I have been taken from American Railway Association Bulletin No. 6, February 6, 1917, and from various later bulletins. Many valuable statistics also in Proceedings American Railway Association, vol. vii, pp. 522–575. See also House Report No. 1553, 64th Congress, 2nd Session, to accompany H. R. 20352, pp. 1–12.

[1] Statistics as given in Table I have not been continued since the railroads were taken over by the government.

lection of statistics on February 1, 1915, the surplus amounted to over 279,000. The shortage after the spring of 1916, as is well known, was coincident with a heavy war traffic.

Statistics of car location indicate that certain sections of the United States suffer much more than others on account of car shortage.[1] For example, box cars considerably in excess of ownership were on the lines serving what are known as New England, Southeastern,

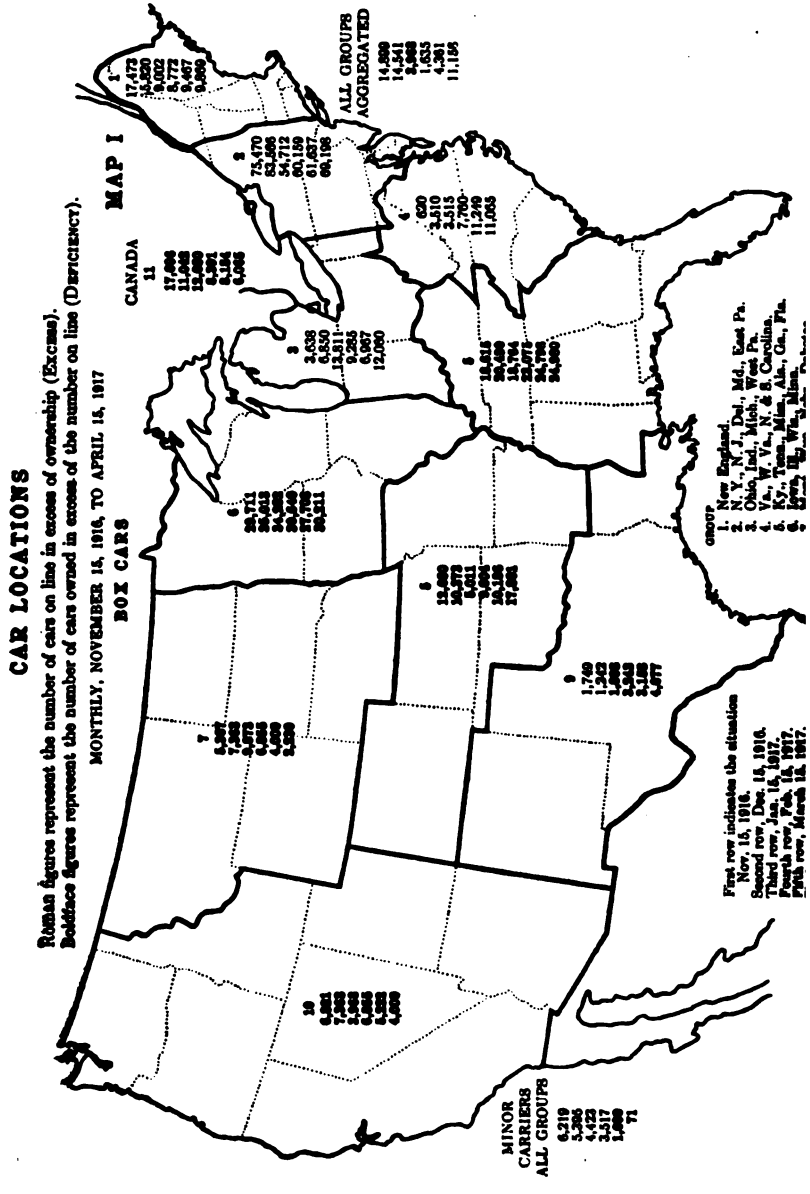
CHART I

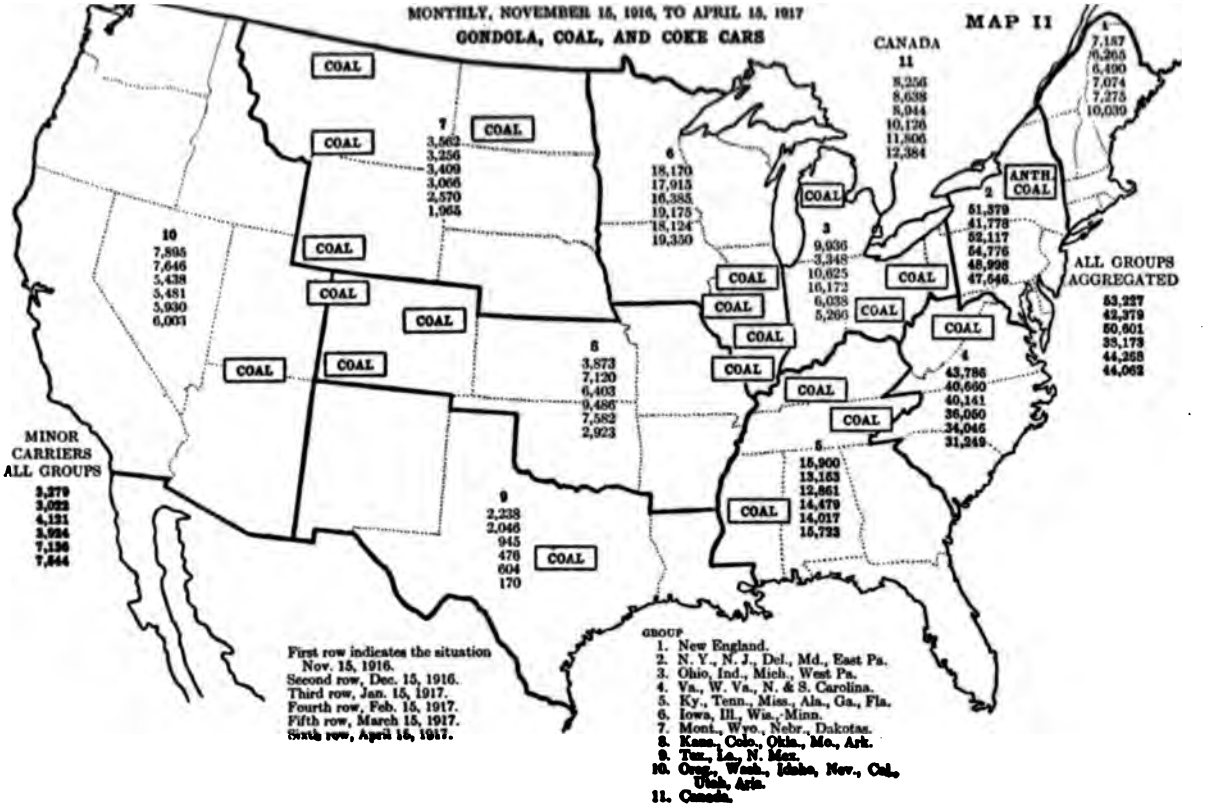


Trunk Line and Central Freight Association territories, represented on Map I [2] as groups 1, 2, 3, and 4. All the other groups were deficient in this class of equipment in comparison with their ownership. Southern, Southeastern and Trunk Line territory, represented by groups 2, 4, and 5 on Map II, are the sections that had less

[1] Car location statements are given in Proceedings of American Railway Association, vol. vii, pp. 524–575. More recent statistics were presented by F. B. Dow, attorney for Interstate Commerce Commission in Hearings on Senate Bill (636), May 3, 1917. Statistics formerly published by American Railway Association are now published bi-monthly by the U. S. Railroad Administration.

[2] Maps from testimony of Dow, ibid., loc. cit.


CAR LOCATIONS
Roman figures represent the number of cars on line in excess of ownership (Excess).
Boldface figures represent the number of cars owned in excess of the number on line (Deficiency).
MONTHLY, NOVEMBER 15, 1916, TO APRIL 15, 1917
BOX CARS
MAP I
CANADA
ALL GROUPS AGGREGATED
MINOR CARRIERS ALL GROUPS
First row indicates the situation Nov. 15, 1916.
Second row, Dec. 15, 1916.
Third row, Jan. 15, 1917.
Fourth row, Feb. 15, 1917.
Fifth row, March 15, 1917.


MONTHLY, NOVEMBER 15, 1916, TO APRIL 15, 1917
GONDOLA, COAL, AND COKE CARS
MAP II
CANADA
11
8,256
8,638
8,044
10,126
11,806
12,384
1
7,187
6,265
6,490
7,074
7,275
10,039
ANTH COAL
2
51,379
41,778
52,117
54,776
45,998
47,646
ALL GROUPS AGGREGATED
53,227
42,379
50,601
38,173
44,258
44,062
7
3,562
3,256
3,409
3,066
2,570
1,965
6
18,170
17,915
16,385
19,175
18,124
19,350
3
9,936
3,348
10,625
16,172
6,038
5,266
4
43,786
40,660
40,141
36,050
34,046
31,249
10
7,895
7,646
5,438
5,481
5,930
6,003
6
3,873
7,120
6,403
9,486
7,582
2,923
5
15,900
13,153
12,861
14,479
14,017
15,723
9
2,238
2,046
945
476
604
170
MINOR CARRIERS ALL GROUPS
3,379
3,022
4,121
3,934
7,136
7,844
COAL
First row indicates the situation Nov. 15, 1916.
Second row, Dec. 15, 1916.
Third row, Jan. 15, 1917.
Fourth row, Feb. 15, 1917.
Fifth row, March 15, 1917.
Sixth row, April 15, 1917.
GROUP
1. New England.
2. N. Y., N. J., Del., Md., East Pa.
3. Ohio, Ind., Mich., West Pa.
4. Va., W. Va., N. & S. Carolina.
5. Ky., Tenn., Miss., Ala., Ga., Fla.
6. Iowa, Ill., Wis., Minn.
7. Mont., Wyo., Nebr., Dakotas.
8. Kans., Colo., Okla., Mo., Ark.
9. Tex., La., N. Mex.
10. Ore., Wash., Idaho, Nev., Cal., Utah, Ariz.
11. Canada.

gondola, coal and coke cars on their lines than they owned. In 1916 the state of Nebraska memorialised Congress to enact legislation which, among other things, would insure the return of equipment to the roads in that section.[1] Conditions were so bad in Illinois about the same time that the Chairman of the Public Utilities Commission of that state made a trip to the seaboard to try to find out why railroad equipment of western lines was being detained in the East. He maintained that grain elevators in Illinois were full and that some elevators had received but one empty car a week, in some cases but one car per month.[2] On a tour in March, 1918, through seven states of the far West and Northwest for the United States Department of Agriculture, to stimulate a greater acreage of spring wheat, President Thompson of Ohio State University found that many of the alleged violations of the rules of the Food Administration in that area were due to the shortage of cars and transportation service. Areas that had much wheat could secure no substitutes; many small places were reported to have received but one car per month; potatoes were rotting in Idaho because they could not be marketed; live stock in some areas were almost starving, while but twelve hours away by rail, hay was rotting that could be transported.

In view of such unequal distribution of equipment among railway systems, it is not surprising to learn that the Interstate Commerce Commission discovered in its investigations in 1906 that in furnishing cars, railroads stipulated that their equipment should not go beyond their own line.[3] If the shipper did not care to consent

[1] For copy of memorial, see Hearings before House Committee on Interstate and Foreign Commerce, 64th Congress, 2nd Session, on H.R. 19546 and H.R. 20256 and H.R. 20352, hereafter referred to as "Esch Hearings."

[2] Esch Hearings, p. 41.

[3] Kansas City Hearings, pp. 192, 196; Minneapolis Hearings, p. 137; St. Louis Hearings, pp. 3, 4, 7, 8, 36, 117, 118. See note 3, p. 139. See also Railway Age, April 26, 1907, p. 683.

to this arrangement, he received no cars. That the roads have continued to resort to this method of keeping their equipment at home is seen from the evidence which was given to Commissioner McChord at Louisville, Kentucky, in November, 1916.[1]

The consequences of the inadequacy of the transportation system have been so insistently forced upon our attention since the outbreak of the war that comment concerning recent conditions is unnecessary. But it is not generally appreciated that transportation has been carried on under intermittent embargoes upon freight for more than a decade. Conditions were so bad more than ten years ago that the Interstate Commerce Commission made investigations, taking testimony relative to conditions at widely separated points.[2] Substantially, all told the same story of failure of transportation facilities and resulting commercial embarrassment and loss.[3] The investigations of the Interstate Commerce Commission at that time showed clearly that the business offered to the carriers was far beyond the transportation facilities. The Commission was informed that farmers, especially in the Northwest, were unable to market their grain because of the inability of the carriers to serve them; and that grain was being stored on the ground in some instances in bins eighteen to thirty feet deep, and covering acres of ground.[4] The testimony taken by the Commission showed that the country elevators were

[1] 42 I. C. C. R. 657 (662).

[2] Testimony was taken relative to conditions in such widely separated areas as the lumber producing regions of Oregon and Washington, the Southern cotton belt, the West Virginia coal fields, and the grain fields of Iowa, Kansas, Nebraska, and the Northwest.

[3] Testimony in Senate Documents, 59th Congress, 2nd Session, Nos. 233 (pp. 1–275) and 333 (pp. 1–502). Document No. 233 contains the testimony taken at St. Louis and Kansas City. The testimony taken at both places is paged consecutively in this document, hereafter referred to as "St. Louis Hearings" and "Kansas City Hearings." Likewise Document No. 333 contains the testimony taken at Minneapolis and Chicago, hereafter referred to as "Minneapolis Hearings" and "Chicago Hearings."

[4] Railway Age, December 7, 1906, p. 722.

full because grain could not be shipped to important terminal elevators. Up to the time the Interstate Commerce Commission made the investigation, in the latter part of December, 1906, important terminal elevators had not been more than one-third full.[1] Naturally this meant much loss to the farmers, not only from grain spoiling or its destruction by vermin,[2] but also because grain buyers insisted upon much wider margins in all purchases, and hence offered a lower price to the farmer.[3] In some instances grain dealers refused to buy grain at any price, because of the uncertainty of getting it to market or the likelihood of damage through heating due to the unusual length of time it would be in transit.[4] Selling grain in terminal markets on contracts was extremely difficult if not impossible. Purchase at a loss was sometimes necessary to cover such contracts.[5] This uncertain movement of wheat and lack of transportation meant that flour mills were often forced to shut down, in some instances for two months at a time.[6] All this meant that farmers were forced to borrow money and pay interest on it and, in some instances, to pay storage and insurance on grain, which later they were compelled to sell at a reduced price. The president of a national bank in the Northwest presented to the Commission letters from 350 banks in his state that had accounts with his bank showing that farmers were obliged to hold their wheat because of lack of cars; and he indicated that altho ordinarily he would not be lending a dollar to

[1] 12 I. C. C. R. 561 (563).

[2] Chicago Hearings, pp. 396, 419, 420, 474, 475; St. Louis Hearings, p. 71, and Minneapolis Hearings, p. 117.

[3] Minneapolis Hearings, pp. 31, 97, 98–99, 113–114, 130, 133, 198; Kansas City Hearings, pp. 270–271.

[4] Kansas City Hearings, p. 212; St. Louis Hearings, p. 50; Minneapolis Hearings, p. 14.

[5] Minneapolis Hearings, p. 102.

[6] Kansas City Hearings, pp. 232, 270–271, 272; St. Louis Hearings, p. 48; Minneapolis Hearings, p. 133.

these banks at that time of year, he had within a sixty-day period extended credit to these correspondents to the extent of $600,000.[1]

There was much trouble also in the marketing of live stock throughout the important live stock areas.[2] Dealers waited for cars weeks and even months. In instances where it was necessary to drive live stock some distance to the station, it had to be kept in yards or small pastures while waiting for cars. This often meant shrinkage in the weight of fat cattle to the extent of 200 pounds per head. It was sometimes necessary to wait so long for cars that it was too great a sacrifice to market cattle, and they were driven back to pasture. Those who were forced to sell their live stock, after waiting for weeks for cars at one station, were compelled to drive them across the prairie from seventy-five to two hundred miles to another railroad, there again to find conditions but little better.[3] The president of the American Live Stock Association testified that in Texas the delays in shipping cattle extended from two months to "any indefinite length of time."[4] The secretary of the same Association testified that in Wyoming it had been necessary to hold sheep at the loading station from thirty to sixty days; and then in some instances it was necessary to trail them for two hundred miles across the country to another railroad.[5] It was sometimes necessary to dip sheep as many as three times while waiting for cars.[6]

[1] Minneapolis Hearings, pp. 119–120; 12 I. C. C. R. 564; for similar testimony by other bankers and elevator men, see Minneapolis Hearings, pp. 117, 132, 170.

[2] It was contended in the Kansas City Hearings (p. 148) that stock men of Panhandle, Texas, alone lost hundreds of thousands of dollars because of inability of railroads to furnish transportation.

[3] Testimony relative to the trouble live stock shippers had in securing railway service, in Kansas City Hearings, pp. 147, 148, 151, 153, 154, 155–158, 162, 163, 166, 173, 174, 175, 183, 190; St. Louis Hearings, pp. 69–70, 115–116; also Senate Doc. 311, 60th Congress, 1st Session (1908), Hearing on S. 3644, pp. 1–134.

[4] St. Louis Hearings, p. 145.

[5] Kansas City Hearings, p. 177.

[6] Ibid., p. 162.

Furthermore, when cars were furnished for live stock, trains moved so slowly that it meant much shrinkage before markets could be reached.[1] Railroads even provided contracts which it was said "shippers had to sign"[2] which gave the railroad the right to ask a shipper to unload at the terminal of their road in order to keep their equipment from going off their own line.[3] Hence shippers were often seriously limited in the markets they were able to reach without great inconvenience and loss.

In the South there was much trouble in the shipment of cotton. Railroad platforms were piled full, and it was stacked upon the ground.[4] Lumber mills found it impossible to run much of the time.[5] The President of the St. Louis Lumber Exchange testified before the Interstate Commerce Commission that it was impossible to sell lumber on contract.[6] This meant that building operations in many states were interfered with. Some building concerns of much stability were on the verge of bankruptcy.[7] All lines of business were of course much affected by the transportation furnished the coal mines; many mines were closed or operated but part time.[8] In 1906, in some places in the Northwest, schools and public utilities were without coal.[9] In some in-

[1] St. Louis Hearings, pp. 116, 147; Kansas City Hearings, pp. 162, 189.

[2] See Senate Doc. 311, 60th Congress, 1st Session (1908), pp. 81, 88.

[3] Copy of such a contract (the Atchison, Topeka & Santa Fe Railway Co.) given in ibid., pp. 81–87. Some railroads went to much expense in unloading dead carload freight in order to keep their own cars on their own lines. Kansas City Hearings, p. 226. Naturally all this unloading for shipment to destination in other cars meant terminal congestion.

[4] St. Louis Hearings, pp. 18–19, 20, 23.

[5] Ibid., pp. 62–64, 137; Chicago Hearings, pp. 387, 424–427; Minneapolis Hearings, pp. 196–197.

[6] St. Louis Hearings, p. 62.

[7] 12 I. C. C. R. 569.

[8] 12 I. C. C. R. 568; Minneapolis Hearings, pp. 27, 66, 67, 69, 73, 74, 76, 86–87, 171; Chicago Hearings, pp. 309, 431; St. Louis Hearings, pp. 20, 25, 37; Kansas City Hearings, pp. 143, 195, 199, 200, 203.

[9] Minneapolis Hearings, p. 235.

stances, railway fuel was used by cities;[1] in others, business establishments were closed and coal was given out in sacks to keep people from freezing.[2] Action on the part of the Interstate Commerce Commission was necessary in securing coöperation of railway officials in charge of traffic to give priority to rush coal shipments into some sections.[3] Coal cars were put even into passenger trains.[4] All this evidence reads much like that which has been in the daily press since the United States entered the war; but it must not be forgotten that the situation here described existed more than ten years ago without any abnormal war traffic to move.

In attempting to determine the causes for the above described inadequacy of transportation facilities in time of peace, attention may be given to the growth of traffic in comparison with the expansion of the railway plant, to the significance of large areas producing raw materials, to the responsibility of the railroads themselves, to the shippers' contribution to the situation, and finally to the program of government regulation.

According to statistics of the Interstate Commerce Commission, the ton mileage of the railroads increased about 118 per cent in the eleven-year period, 1895–1905 inclusive; while during the same period, the increase in railway mileage was about 21 per cent.[5] Three-fourths of this new mileage was in new sections that merely added to the congestion of the old.[6] James J. Hill told the Interstate Commerce Commission in 1906 that the

[1] Minneapolis Hearings, pp. 93–94, 128–129.

[2] Ibid., p. 171; Chicago Hearings, p. 309.

[3] Minneapolis Hearings, p. 92.

[4] Ibid., p. 284, testimony of Howard Elliott. The experience in this section at this time contributed toward the priority given in 1917 to coal destined for points beyond the Lakes in order that an ample supply might be transported before the close of navigation.

[5] Statistics of Railways in U. S., 1905, pp. 12, 67–69.

[6] Minneapolis Hearings, p. 295, testimony of J. J. Hill.

commerce of the country and its growth was against a stone wall so high that it was not possible to see the top of it. He maintained that it was as impossible to bore an inch hole with a half-inch auger as it was to drive the business then being offered through the facilities which the railroads had.[1] Hill contended that conditions were growing worse; that there should be an addition to the railway mileage that then existed of from 25 to 33 per cent; that in addition, there would need to be much spent for new equipment, reduction of grades, double tracking, and terminal facilities. He believed it would be necessary to spend at least $5,500,000,000 yearly for a period of five years to make the railroads equal to the task then before them.[2] That the railroads had more business than they could handle in 1906 is clear from the testimony of many railway officers in the investigation of the Interstate Commerce Commission at that time. The general manager of the Northern Pacific Railroad testified that in some instances they did not place cars in competitive territory, in the hope that the other railroads would take the business.[3] The third vice-president of the Rock Island Railroad stated that his road followed the practice of trying to get customers to ship over other roads.[4] The general superintendent of freight transportation of the Pennsylvania lines west of Pittsburgh stated that their agents were instructed to try to persuade shippers to ship by other lines.[5]

In the eleven-year period 1906–16 inclusive, the ton mileage increased nearly 60 per cent, while mileage

[1] Minneapolis Hearings, loc. cit., Howard Elliott made similar statements. Ibid., pp. 281–291. See also St. Louis Hearings, pp. 93–94; Kansas City Hearings, p. 215.

[2] Minneapolis Hearings, p. 296; St. Louis Hearings, p. 15; Kansas City Hearings, p. 185. See statement of Manager of Transportation Dept., Chicago Board of Trade, Railway Age, vol. 44, pp. 614–619.

[3] Minneapolis Hearings, p. 221.

[4] Chicago Hearings, p. 317.

[5] St. Louis Hearings, p. 91.

increased about 16 per cent.[1] In other words, it appears that the transportation plant as a whole has not kept pace with the growth of traffic. In the annual report of the Interstate Commerce Commission for 1916, it is claimed that whenever business generally is good and times are prosperous, there is widespread difficulty and complaint due to inability to secure satisfactory transportation services from the railroads. The Commission points out that this difficulty recurs during the fall and winter months of practically every year with regard to transportation of coal, and usually also in connection with the movement of grain when the crops are good.[2]

Inefficient and unsatisfactory railway service, however, may result from the improper use of facilities as well as from their insufficient supply, and it is this phase of the problem with which this article is concerned. Adequacy of the railway plant as a whole would not necessarily guarantee satisfactory service to different classes of shippers or to the different sections of the United States. Evidence has already been given (Maps I and II) which indicates that some sections of the country suffer very much more than others from a shortage of equipment. A fundamental reason for this is that this large country is roughly divided into areas which produce raw materials, and into sections which engage in various lines of manufacture. Areas producing bulky raw materials must have many cars to serve their needs for outbound loading; furthermore, the movement of cars under load into such areas is light, and therefore such areas of "one-way" shippers find it difficult to secure all the equipment they need. To this perfectly natural force, which tends to bring about a very unequal

[1] Annual Report I. C. C., 1916; table facing p. 74; Statistics of Railways in United States, 1906, p. 16; and Abstract Statistics of Steam Railways in United States (I. C. C. R.), 1916, pp. 2, 6.

[2] Annual Report I. C. C., 1916, pp. 67–68.

distribution of railway equipment and great inequalities in railway service, must be added several others. The railroads, the shippers, and regulating bodies are all responsible to some extent for this condition of affairs.

The general public has generally held the carriers responsible for inadequate transportation facilities. There is a widespread belief that railroads are accountable for the trouble because of a shortage of cars. It is a fact that certain railroads do not have adequate rolling stock.[1] Indeed some small railroads have no cars whatever, and they rely wholly upon their connections for equipment.[2] In one state in 1907, railroads having 10 per cent of the total mileage relied entirely upon other lines for their equipment.[3] In the late eighties, railroads sometimes made contracts to "furnish cars" used in traffic with other roads, the assumption being that the roads making the contract were to furnish their own cars; if they did not, they were to assume the mileage on any foreign cars used in this joint business.[4] Evidence indicates that railroads assumed, but in many instances did not pay, the mileage to the road that owned the cars.[5] In view of conditions in 1906 and 1907, it was natural that the American Railway Association, at its meeting in October, 1907, should have adopted a resolution that it was "a basic principle that ultimately every road should furnish sufficient equipment to take care of its local traffic moving within the confines of its own road, and also its proportion of all equipment required for through traffic."[6] The Interstate Commerce Commission through Commissioner Cooley early laid down the

[1] 1 I. C. C. R. 775; 12 I. C. C. R. 573; St. Louis Hearings, pp. 3, 4, 119, 120; Kansas City Hearings, pp. 184, 185.

[2] Proceedings National Association Railway Commissioners, 1912, pp. 343–344.

[3] 12 I. C. C. R. 574.

[4] Proceedings American Railway Association, vol. i, p. 183.

[5] Ibid., loc. cit.

[6] Ibid., vol. v, p. 37.

principle that it was the duty of the carrier to provide itself with rolling stock for the normal business which it proposed to carry.[1] It was contended in the Chicago Hearings [2] in 1906, that the Interstate Commerce Commission should be given power to compel a railroad to buy its proper share of equipment. One line ought not find it necessary to buy so much equipment that it would not have room on its own rails to store its own cars during periods of slack business.[3] But such inequalities between different systems would not necessarily indicate the insufficiency of the total supply.

Examination of Table I shows that the supply of rolling stock in this country has been ample except in certain seasons of certain years. From 1907 to 1916 it appears that there were five years in which there was no net shortage at all, and two other years in which the shortage was only nominal. In fact, only three years in this period show any marked lack of cars. According to facts presented by the American Railway Association, there were 423,183,191 idle car days on the railroads of the United States from 1906 to 1916; and counting the average earnings of a car as $2.50 a day, this would mean $1,057,957,977.50 as the loss to the railroads on account of dull times and hence idle cars during the ten years. There were 31,543,316 car shortage days in the ten years and, on the same basis, the loss to the railroads because they could not furnish cars was $78,858,290.[4] If these figures are to be relied upon, it is clear that it is not to the interest of the railways as a whole to increase materially the supply of cars. It is a fact, how-

1907 ?

[1] 1 I. C. C. R. 722. [2] P. 360.

[3] Commissioner Hall testified before the House Committee on Interstate Commerce in 1916 that instances had come to the attention of the Interstate Commerce Commission of roads that did not have room on their own rails for their own cars during periods of slack business, and were obliged to store them on the ground. Esch Hearings, p. 15.

[4] The American Railway Association Bulletin No. 6, February 6, 1917.

ever, that there were actually fewer cars in service in the United States in 1915 than in 1914, and fewer in 1916 than in 1915;[1] and this lack of equipment combined with an enormous war traffic has of course caused much embarrassment. In 1914 and 1915, the railroads did not buy the usual number of cars. In 1916, they were unable to secure them. Much railway equipment has been made in the United States for our allies, and some car manufacturers ceased to engage in the prosaic business of manufacturing railway equipment because of better opportunities in other lines.

Without attempting to minimize the importance of a shortage of rolling stock, which at times causes much embarrassment, it must be pointed out that the problem is one which involves much more than a mere deficiency of equipment. As Commissioner Lane indicated more than ten years ago, the problem of car shortage is one which is connected with every factor of railroading — the construction, operation, maintenance and financing. He rightly maintained that the problem of transportation is so closely interwoven with the fabric of our commercial organization that one may not lightly say what are the multitudinous considerations which necessarily enter into so simple a question as the reason why a car is not at once forthcoming when ordered. As he pointed out, the inability of the shipper to secure a car may be but a symptom of a deep seated and organic trouble.[2] Examination of Table I indicates that much attention which has been given to the subject of car supply might better have been given to the conditions which affect car operation.[3] In fact, at times when there has been

[1] The numbers were as follows: 1914, 2,325,647; 1915, 2,318,305; 1916, 2,298,263; Annual Report I. C. C., 1916, table facing p. 74; I. C. C. Abstract of Statistics of Steam Railways in the United States, 1916, p. 3.

[2] 12 I. C. C. R. 574–575.

[3] See statement of J. J. Hill, Minneapolis Hearings, p. 298; Proceedings National Association Railway Commissioners, 1912, pp. 246–247.

most embarrassment because of the insufficiency of transportation facilities, it has resulted more from congestion in terminals and on side tracks than from car shortage.[1] At such times more cars would have made conditions worse instead of better, for additional equipment would merely have added to the congestion.

The problem of car operation has been increasing in significance as our commerce has become more interstate in character, and as the relation of the railways to each other in the handling of traffic has become more complex. When our railways were first built, the question of exchange and interchange of railway equipment was not an important one. The lines were then short and disconnected. They served a local community only, and as a rule equipment did not go beyond the termini of the home road. Indeed, railroads were built on different gauge in order to keep cars on the home track, and some states framed charters designed to prevent through routes so as to keep the business within their borders.[2] In view of these primitive conceptions and conditions, it is not surprising to learn that an early decision of the Interstate Commerce Commission upheld a railroad which refused to furnish cars for points beyond its own line. This decision was based upon the theory that local traffic enjoyed rights superior to through traffic. The Commission observed in this case that " if this company (Pittsburgh and Lake Erie Railroad) should send its cars . . . to Buffalo, . . . this

[1] See statement of Commissioner Clark before the Chicago Traffic Club, Railway Age, November 1, 1907, pp. 614–616; statement of J. J. Hill, Minneapolis Hearings, p. 295; see also ibid., pp. 311, 318; Proceedings National Association Railway Commissioners, 1912, pp. 246–247; 12 I. C. C. R. 564; Annual Report I. C. C., 1916, p. 68; address of Howard Elliott, Proceedings Railway Development Association, November, 1915, pp. 25–32; St. Louis Hearings, p. 15; Kansas City Hearings, p. 216. Space does not permit of a discussion of the vital problems of railway service in terminals, and of the coördination of rail and water carriers. These subjects must be left for future consideration.

[2] McPherson, Railroad Freight Rates, pp. 161–162.

would have stripped this railroad of its equipment, leaving the other business along its line to go to ruin. . . ." The Commission contended further that the railroad's "first and most paramount legal duty to the shipping public was to make its entire freight equipment do its utmost in serving the shippers along its own line. . . ." [1] With the growth of the country, it has been necessary to develop standard gauge [2] and to consider railroad equipment something like a negotiable instrument. It is now imperative that cars be sent freely from one system to another, hence the vital importance of equitable car service rules and their honest observance.

When carriers began to interchange equipment in through traffic, they paid for it on a mileage basis. This led to great abuses. The method of computing mileage often made it impossible for a railroad to get any pay for the use of its cars in the local service of another railroad, and such local usage was widely practiced.[3] There was much dishonesty in making reports, and foreign equipment was much used for storage purposes under the mileage plan. Finally in 1902, this basis gave way to the per diem method of payment.[4] As soon as this system went into effect, the committee on car service of the American Railway Association was able to report improvement in the return of cars to their owners, which resulted in an increase in the available car supply.[5] The

[1] Riddle, Dean & Co. v. Pittsburgh & Lake Erie R. R. Co.; 1 I. C. C. R. 688 (693).

[2] Altho the standardisation of the gauge of American railroads was carried out principally between 1860 and 1870, the standing resolution of the American Railway Association that the standard gauge should be 4 ft. 8½ in. was not adopted until April 7, 1897. Proceedings, vol. vii, p. 1220.

[3] Ibid., vol. i, p. 183.

[4] Ibid., loc. cit.; for summary of objections against the mileage basis, see ibid., vol. ii, p. 748; history of per diem from its proposal, April 25, 1900, to its final adoption is given in ibid., vol. iii, pp. 160–168, 198–215, 251–263, 279, 280, 292, 410–415, 434, 435, 552–595, 1019–1024.

[5] Ibid., vol. iii, p. 1039.

per diem was twenty cents per day in the beginning, but it has been modified from time to time in an attempt to make it to the interest of carriers to return equipment promptly. But even increased per diem charges do not return cars when there is a great demand for them and when it is profitable to use foreign cars in local service.

Statistics of car location (Maps I and II) show that cars accumulate in certain sections of the country in certain months of the year. As has been suggested, this is the result in part of traffic taking its normal channels, but it is also due to the fact that car service rules are honored more in the breach than in the observance when there is much demand for equipment. The railroads frankly confessed this fact before Commissioner McChord in the Hearing at Louisville, Kentucky, in November, 1916.[1] The record in this hearing shows that the Car Service Commission of the American Railway Association found over 40,000 violations of car service rules in the month of June, 1916, and that the evidence was so overwhelming that further inspection was abandoned.[2] Such a practice on the part of the railroads places a great burden on those sections of the country which, as has been indicated, produce mainly raw materials, the sections which normally load much freight out but receive little inbound freight. Whenever there is a heavy demand for cars, such sections suffer much from car shortage, for they cannot provide themselves with empties like sections that are receiving a constant stream of cars under load. It is evident that the "one-way" shippers are dependent upon a fair observance of car service rules for a supply of equipment.

The effect upon the railways in such regions is equally apparent. Railway systems in the West suffer severely

[1] Car Supply Investigation, House Doc. 2116, 64th Congress, 2nd Session, p. 8.

[2] See testimony of Commissioner Hall, Esch Hearings, pp. 36–37; also Traffic World, November 11, 1916, p. 956.

from lack of equipment, regardless of their original supply. Their cars, which are loaded and destined to the Atlantic ports, are often used for local business there or are loaded and sent back to some point, say in Trunk Line or Central Freight Association territory, and unloaded only to be reloaded and sent again to the Atlantic coast. In 1906, James J. Hill sent a representative of the Great Northern Railroad to the East to discover where Great Northern equipment was being detained. The representative found that their equipment was being used to haul ice from Maine to Boston and that these cars had "been in that service for months and months." [1] Thus, through the disregard of car service rules, the cars of railway systems west of the Mississippi River shuttle back and forth throughout the eastern portion of the United States. Coal mines as well as producing areas belong to the unfortunate group of one-way shippers. Consequently railroads which serve coal mines often find it difficult to secure the return of coal cars that go beyond their own lines. A typical case of this sort came before the Interstate Commerce Commission in 1910. The superintendent of transportation of the Illinois Central Railroad had attempted to secure an agreement from a number of connecting roads that they would observe car service rules and return coal equipment promptly. The reply of the Missouri Pacific is typical.

[1] Testimony of Hill, before the Interstate Commerce Commission, Minneapolis Hearings, p. 300. Little wonder that Hill should say: "The car thief is the worst kind of a thief. Thieves are all bad but I think the car thief is the worst." Ibid., loc. cit. See also discussion upon the adoption of the per diem method of payment before the American Railway Association in Proceedings, American Railway Association, vol. iii. p. 565.

A little road in Iowa about 100 miles long said to have the largest amount of cars per mile of any railroad in the United States has had much trouble in keeping equipment adequate to their needs because they ship out clay and gypsum products that go to distant points, and the number of cars that come over their system under load does not correspond with the number they ship out, hence in a time like the last two years they have much trouble from car shortage. (See a statement of E. D. Chassel of the Railroad Commission of the state of Iowa, Hearings before House Committee on Interstate and Foreign Commerce, 64th Congress, 2nd Session, on H. R. 19546, etc., p. 58.)

That railroad indicated that it would be glad to observe the car service rules, unless they were disregarded by other lines. In that event it would be compelled to confiscate whatever cars it found upon its lines. The Illinois Central finally issued an order to the effect that none of its cars could be loaded with coal destined for points beyond its own lines. Whereupon the Missouri and Illinois Coal Company, which was thereby prevented from marketing coal on its contracts in St. Louis, appealed to the Interstate Commerce Commission for relief. Reversing the earlier decision [1] it was held that the action of the Illinois Central was illegal; but the Commission made no order in the case, indicating that it was the first duty of the carriers to work out equitable car service rules among themselves.[2] Clearly the refusal of railroads to observe their car service rules has meant inequity in car distribution not only among different shippers and different sections of the country but also among the railroads themselves. Such practice on the part of the carriers gives little incentive to any individual line to increase its car supply. Railways are, however, not altogether responsible through non-observance of car service rules for the fact that railway equipment becomes congested in some sections and lacking in others. Both shippers and regulating bodies share this responsibility.

The responsibility of shippers for the inability of carriers to render adequate service is greater than has commonly been recognized. Among the practices of shippers which contribute to the inadequacy of transportation facilities may be mentioned the detention of equipment longer than is necessary to unload it, the use of cars for storage purposes, the abuse of the reconsignment privilege and finally by continuing trade customs

[1] See p. 150, note 1, supra. [2] 22 I. C. C. R. 39 (41).

that should have changed *pari passu* with enlarged capacity of railway equipment. These practices have meant an inefficient use of equipment. Bad habits of American shippers have been developed to a great extent by competition between carriers. For some years American railroads were built out into territory where nobody lived, and from that point on out to where nobody cared to go.[1] Because of the excess of transportation facilities it was natural that competition between carriers should have brought about very liberal use of railway equipment by shippers. Some railroads had ample warehouse or storage room which they gave free to shippers in order to get their business. Others that did not have storage room offered their cars or as was often the case the cars of other railroads.[2] As late as 1887 when the board of directors of the New York and New England Railroad reluctantly permitted the vice-president and general manager of that road to levy a demurrage charge on shippers for detention of equipment, the competing lines with the exception of the Boston and Albany began soliciting New England patrons with promises of unlimited car storage.[3] Altho earlier attempts [4] than that of the New York and New England Railroad were made to levy a demurrage charge for detention of equipment by shippers they do not appear to have been taken seriously,[5] especially so far as it affected big shippers [6] or competitive points.[7] In fact any one railroad found it very difficult to insist upon payment of demurrage without a loss of business,

[1] See an article by Charles Francis Adams, North American Review, April, 1875.

[2] Chicago Hearings, p. 337; see St. Louis Hearings, p. 140; Proceedings National Association Railway Commissioners, 1909, p. 214, and 1914, pp. 41–42.

[3] Railway Age, February 8, 1907, p. 171.

[4] Ibid., loc. cit.; also Railroad Age Gazette, October 30, 1908, pp. 1234–1236.

[5] Proceedings National Association Railway Commissioners, 1909, pp. 236–237, 240.

[6] Ibid., p. 221.

[7] 18 I. C. C. R. 38; 25 I. C. C. R. 216. Proceedings American Railway Association, vol. i, p. 173.

and car service associations were finally formed to collect[1] for all railroads. Even then shippers resisted payment of these charges and carried their cases to the Interstate Commerce Commission but without success.[2]

The extent to which shippers use railway equipment for storage purposes is difficult to measure. Reporting upon evidence presented in the investigation of the Interstate Commerce Commission in 1906, Commissioner Harlan pointed out that both railroad men and shippers admitted that cars were constantly used by shippers as warehouses, and that the time allowed to them for loading and unloading was in excess of real necessity.[3] Naturally through liberal treatment of shippers on the part of railways in the use of railway equipment, habits were developed of relying upon the railway to furnish much of the "business plant." The very rapid development of our commercial centers has contributed not a little to the insistent demand on the part of the shipping public for a continuation of early privileges in the use of the railway equipment in connection with their business. Inasmuch as land has ad-

[1] List of demurrage bureaus, see Bull. 191, U. S. Dept. of Agriculture, March, 1915, p. 24.

[2] 11 I. C. C. R. 166; see also 18 I. C. C. R. 234.

[3] 12 I. C. C. R. 579. Commissioner Lane said that the contention that car shortage had been caused by the use of cars as warehouses was without support so far as the testimony given at Minneapolis and Chicago indicated. He maintained that the demurrage accounts of the railroads showed that to a very limited extent did "consignees avail themselves of the right to hold cars as warehouses and pay demurrage thereon." 12 I. C. C. R. 571. While this might be true as applies to agricultural areas to apply it generally would appear to overlook the fact that even in more recent years demurrage accounts might not be a true measure of the extent to which shippers were holding cars. J. A. Shinn writing in the Railway Age (February 8, 1907, pp. 171–172) maintained that in 1893 it was notorious that many big firms owed tens of thousands of dollars which was not paid and which no attempt was made to collect. Even as late as 1909, the Committee on Car Service and Demurrage of the National Association of Railway Commissioners reported that the collection of demurrage from large industries was still somewhat of an anomaly; that in some sections of the country the railroads were carrying on their books uncollected demurrage of hundreds of thousands of dollars; that the failure to enforce demurrage rules had been "particularly notorious." Proceedings National Association Railway Commissioners, 1909, pp. 221, 240. If these statements are to be relied upon it is fair to assume that an important portion of demurrage was never even placed upon the books. See also American Railway Association (Bulletin) February 6 and May 9, 1917.

vanced in value very rapidly in our cities, it has been cheaper to rely upon the carriers for adequate storage and track space than to provide it otherwise.[1] The charge for the use of railway equipment has not advanced in the same ratio that the value of real estate has risen; indeed the charge for detention of railway equipment had remained almost stationary until recently advanced by the Director General of Railroads. Even those business concerns, which a generation ago had sufficient storage or track space, have found it economical to use this space for enlarging their capacity, leaving the burden of their enlarged capacity upon the carriers.[2] This applies to the shipping in of large orders of raw materials bought under favorable market conditions as well as to the daily output of a concern. In a case in the former class which came before the Interstate Commerce Commission as late as 1912, the shipper resisted the payment of demurrage, but the Interstate Commerce Commission very properly held that the demurrage should be paid.[3] When the railroads applied to the Interstate Commerce Commission a little over a year ago for permission to reduce free time on domestic freight held in New Jersey for final delivery to New York, Brooklyn and elsewhere, and for permission to increase the charge for storage for both export and domestic delivery at New York harbor points, neither measure was for the purpose of increasing revenue but to relieve freight congestion.[4]

In the case of some concerns which have adequate storage, their facilities for unloading may be so primitive as to occasion much delay to railway equipment.

[1] See 14 I. C. C. R. 170; 16 I. C. C. R. 116; Proceedings National Association Railway Commissioners, 1913, pp. 367–368.

[2] See Chicago Hearings, p. 358.

[3] 25 I. C. C. R. 399.

[4] Newlands Hearings, p. 900.

The evidence reflected in Map II appears to reveal that the economies sought by the railroads in building self-dumping coal equipment are to a large degree offset by the fact that many consignees do not have proper facilities for unloading such cars. Investigation was made by a railroad company that found its coal cars were being unduly detained; and it was told by dealers in Kansas, Oklahoma and other states that it was cheaper for them to hold the cars and pay five or six days demurrage than it was to unload the coal in bins and reload it again in wagons.[1]

It is clear that railway competition, together with early liberal precedents, makes it difficult for railways to put wholesome pressure upon shippers to provide their own storage.[2] For more than twenty-five years the Lehigh Valley Railroad Company provided in its tariffs that cars containing anthracite coal forwarded to Perth Amboy for transshipment by boat and held at that port would not be subject to demurrage; it was further provided that free storage in bins would be given for a period of two years to such shippers. But the Interstate Commerce Commission upheld the Lehigh Valley in 1915 in its refusal to continue to furnish free storage bins, or to permit cars to be detained without demurrage charges.[3] The Interstate Commerce Commission has held that the carrier has a right to unload car load freight at the end of free time in order to secure its equipment,[4] but this in practice is often very difficult for the carrier to do in congested terminals, where the need is greatest for releasing equipment.

Abuse of the reconsignment privilege has become important in recent years through a substantial increase

[1] Kansas City Hearings, p. 259.
[2] 41 I. C. C. R. 506; 43 I. C. C. R. 472.
[3] 36 I. C. C. R. 140; see also 37 I. C. C. R. 441.
[4] 18 I. C. C. R. 234.

in the number of commission men and brokers,[1] who have relied almost entirely for their "business plant" upon the railway. But such a practice is by no means a new one. The manager of the Railway Clearing House Association of Boston observed in 1888 as follows: "When one sees with what coolness a man hires desk room in an office and starts out in the grain, lumber or coal business without a storehouse of any kind, no lumber or coal sheds or a square foot of yard room anywhere, trusting entirely to the railway companies to substitute their cars for storehouses and sheds, *charging him nothing*, one is lost in amazement."[2]

Reconsignment may be necessary in some cases because of the uncertain or slow movement of trains.[3] This is especially true of fruits, vegetables, or other perishable commodities. Shippers may resort to reconsignment to keep their list of customers from their competitors,[4] or to escape demurrage charges.[5] Finally, it is considered necessary because of certain trade conditions, which in many instances have been brought about through the use and abuse of reconsignment itself. In investigations made in 1917 at New York, in regard to food speculation, it was learned that car loads of perishable foodstuffs were sometimes sold a dozen times and

[1] A car service manager testified before the Interstate Commerce Commission in 1906 that middlemen had increased from two to five times but that they had not increased their facilities. (St. Louis Hearings, p. 141.) Both the mushroom expansion of many business concerns as a result of the war, and also the indefiniteness of the future, have caused many establishments to depend entirely upon the railway plant for storage facilities. Freight equipment has been used as coal bins from which the daily supply has been taken. The statement was made before the Esch Committee that owing to lack of storage facilities Detroit has but a three days' coal supply on hand. (Esch Hearings, p. 27.) Much evidence along this line was given in hearings before the Public Utilities Commission of Ohio in February, 1917.

[2] Proceedings American Railway Association, vol. i, p. 184. See also 12 I. C. C. R. 571. Proceedings National Association Railway Commissioners, 1913, pp. 362–363. Railway Age, December 28, 1906, p. 802.

[3] Kansas City Hearings, p. 268. Chicago Hearings, p. 433.

[4] Kansas City Hearings, p. 256.

[5] See Proceedings National Association Railway Commissioners, 1914, p. 42.

nearly every time they were sold a reconsignment was made.[1] The handling of grain and other commodities through a third party or commission house has created laws providing for inspection either by state or regularly authorized boards of trade, and the tariff governing demurrage has conceded the right and allowed free time for inspection. Instances have been cited of grain which moved through fifteen different markets, being subject to official inspection at each of the markets before it was ultimately unloaded.[2] It was contended before the National Association of Railway Commissioners in 1913, that 90 per cent of the grain tonnage was handled through so-called commission firms that had very little if any storage room of their own.[3]

Like other privileges enjoyed by shippers, reconsignment had its origin in the days of fierce railway competition when traffic was not so plentiful as it has been in recent years.[4] Furthermore, railway competition has extended the time for reconsignment in many cases beyond what is necessary.[5] Shippers unfortunately do not fully appreciate that with a change in conditions insistence upon what they have come to consider as a right is after all the abuse of a privilege which results in injury to themselves. That the Interstate Commerce Commission has always looked upon reconsignment as a

[1] A car load of potatoes was sold to a New York jobber and by him sold to a Chicago jobber, and the car reconsigned to Chicago: the Chicago jobber sold it to a Cincinnati dealer and the car was reconsigned to Cincinnati: the Cincinnati dealer sold it to a Cleveland dealer and the car was reconsigned to Cleveland, and so the thing went on through half a dozen more transactions covering a period of more than thirty days, meantime the car itself was standing in the yards in one of the upstate cities of New York. Railway Age, August 31, 1917, p. 370.

[2] National Association Railway Commissioners, 1913, pp. 361–362; see also Esch Hearings, p. 11; St. Louis Hearings, pp. 114, 123. It has been contended that much terminal delay could be eliminated by providing as far as possible for inspection of grain before shipment. Kansas City Hearings, p. 265.

[3] Proceedings National Association Railway Commissioners, 1913, p. 361.

[4] Railway Age, October 5, 1906, p. 415.

[5] Proceedings National Association Railway Commissioners, 1909, pp. 220–221; 12 I. C. C. R. 571.

privilege, not as a right, is clear,[1] and this body has not been slow to condemn the abuse of this privilege. The Commission has maintained that it is worse in its effects than rebates.[2] The president of an important belt line railway testified before the Interstate Commerce Commission that reconsignment is the largest factor in terminal delays.[3] Testimony given in the Louisville Hearings in November, 1916, was to the effect that car shortage on the Illinois Central Railroad would have been reduced one-half if cars held for reconsignment had been released.[4] Beyond doubt a considerable amount of traffic which blocks sidings and congests terminals should not require the reconsignment privilege; it is manifestly unfair that a consignee who is able to receive his freight promptly should be prevented from doing so because traffic held for reconsignment congests yards, sidings, and terminals. Just as the disregard of car service rules among carriers gives little incentive to any one road to provide ample facilities, so does disregard of car service rules between railroads and shippers leave little incentive to a shipper to provide adequate facilities for handling his freight; it even puts a premium on the "shipping-to-order" practice.

Trade customs relative to commercial units have meant an inefficient use of railway equipment. Orders have been given for the same amounts that were customary when the capacity of railway equipment was much less than it is now. Within a ten-year period the number of freight cars increased 37 per cent while the load carrying capacity increased 60 per cent. Statistics of the Interstate Commerce Commission indicate that this

[1] 16 I. C. C. R. 387.

[2] Railway Age, February 8, 1907, p. 171.

[3] Chicago Hearings, pp. 410–411; St. Louis Hearings, pp. 122–125; Traffic World, November 11, 1916, pp. 962–966.

[4] Ibid., November 18, 1916, p. 1006.

increased capacity has not been utilized.[1] In June, 1917, the Railroads' War Board pointed out that the average car load was but 15.5 tons or only 42 per cent of the average capacity of cars.[2] The excellent records of maximum loading since that time show what might be possible even without the spur of patriotism.[3] But it would appear that as long as shippers continue the practices which have just been described it will be impossible to determine with any degree of certainty the need for transportation facilities.

Those who represent the interests of the carriers have been as ready to contend that government regulation is responsible for inadequate transportation facilities as the public has been to lay the responsibility upon the railroads. It has been claimed that the return to the railways has not been sufficient to enable them to furnish the facilities which are needed.[4] The Interstate Commerce Commission and the state commissions have hesitated to grant increases in railway rates probably because they have feared that an increase in railway income would induce an increase in railway capitalization; and that increased capitalization in turn would be presented as justification for another increase in rates. The vicious circle ought to be broken by increased knowledge of the value of the railway plant combined with supervision over the issue of railway securities. The public cannot afford to pay less for transportation than it costs to produce it. But this discussion is concerned with the efficient and maximum use of facilities, once they are provided. Indeed such use even determines the supply of facilities which will be needed.

[1] Table facing p. 74. Ann. Rept. I. C. C., 1916.

[2] Railroads' War Board, Official Public Bulletin No. 7, June 26, 1917.

[3] Much valuable information in American Railway Association Bulletins.

[4] This has been emphasized in the program of the railroads as presented in the Newlands Hearings. For statements of A. P. Thom, see pp. 213, 214, 218; Judge Lovett, pp. 682–684; Julius Kruttschnitt, pp. 892, 866–968, 972–973.

federal regulation has doubtless interfered with the proper use of railway facilities. The prohibition of pooling by the act to regulate commerce and the application to the railroads of the theory embodied in the Sherman law has made it difficult to use the railway plant in an economical manner. The Panama Canal Act has not been conducive to economy and efficiency in the operation of rail and water systems. The right of the shipper to route his freight as he has wished has meant much economic waste in our transportation. But federal legislation, or as will appear presently the lack of it, is not the only hindrance to efficient and sufficient railway service. State laws also, which have regulated railway operation and service, have prevented an equitable and economical use of railway facilities.

Some states have attempted through legislation to give shippers within their borders an advantage over their competitors in other states. This can be done by low intrastate rates, but it may make such inroads on railway revenue that a carrier will have insufficient funds to provide adequate facilities. Judge Lovett testified before the Newlands Committee that the increase in rates given by the Interstate Commerce Commission at the beginning of the European War was practically offset in the state of Pennsylvania by reduction of the rates on coal to tidewater points.[1] Carriers may be prevented from financing their properties to advantage by state regulation of security issues.[2] Complaint was made before the Newlands Committee that the New York Central, which has only a total right of way in Illinois of about 140 miles, altho it operates 6034 miles of first track, was taxed $600,000 by that state as a condition precedent to its approval of an intended financ-

[1] Newlands Hearings, pp. 716–717.

[2] Ibid., pp. 76, 98, 109, 894, 927–928.

ing; also that Arizona in return for approval of an issue of securities asked that litigation concerning passenger fares be dropped and that a new station be built at Phoenix.[1] The Hadley Commission, in commenting upon state regulation of security issues, said they believed the time was near when the difficulties of the present system of dual control, and the conflict of state laws would become so manifest that further legislation would be imperative.[2]

State industries may be favored by legislation regulating directly the service which carriers must furnish to shippers. A state that fixes low car load minima may benefit some of its industries but it will absorb more than its fair share of railway equipment. Likewise if one state gives much free time to shippers this means that equipment is detained and shippers in other states are deprived of its use. C. F. Staples, member of the Minnesota Railroad Commission, told the National Association of Railway Commissioners in 1909 that he could readily understand why no railroad in Minnesota would permit one of its cars loaded with flour to go down into the New England states, for there they permitted four days free time for unloading, which of course meant much delay to Minnesota farmers who were clamoring for cars.[3] It is evident, too, that anything which increases detention of equipment at the same time increases the aggregate supply which is necessary to move a given tonnage. The unsatisfactory character of regulation of demurrage by the separate states brought about the adoption of a uniform demurrage code by the National Association of Railway Commissioners in 1909

[1] Newlands Hearings, p. 928, see also pp. 76–84.

[2] Rept. of the Railroad Securities Commission, House Doc. No. 256, 62nd Congress, 2nd Session, p. 8.

[3] Proceedings National Association Railway Commissioners, 1909, p. 277. See the statement of a member of the Minnesota Railroad Commission before a Senate Committee in 1917. Hearings, S. 636, May 3, 1917, p. 19.

and the Interstate Commerce Commission approved this code the same year. The year following it was approved by the American Railway Association. According to a bulletin of the United States Department of Agriculture published in March, 1915, there were at that time twenty-four states that had adopted the uniform code for intrastate traffic, and in the other twenty-four altho there was a tendency to conform more nearly to the provisions of the uniform code, the exceptions thereto and the number of special provisions in the state codes were important.[1]

Following the acute conditions in 1906 and 1907, about twenty states passed so-called reciprocal demurrage laws. Similar legislation was introduced into Congress,[2] and the Interstate Commerce Commission was asked to make a ruling governing reciprocal demurrage; but it held that it had no authority to make such a rule.[3] Such legislation requires railroads to supply shippers with cars on penalty of so much per day for each car not furnished. Some of the state laws were drawn in such a way that they were declared illegal, and fortunately the decisions of the courts brought little enforcement of the legislation in many other states, and in some the legislation has been repealed. Aside from the weakness of such a law, were it applied generally, to have it in some states and not in others, means interference with interstate commerce and an unequal distribution of equipment among states. It puts a premium upon the retention of a carriers' cars upon its own lines and hence under its own control, which in turn interferes with free exchange and interchange of equipment. In view of this fact it might not be worth while to fur-

[1] Bulletin No. 191, U. S. Dept. of Agriculture.

[2] For a copy of a bill (S. 3644) and hearings on same, see Sen. Doc. No. 311, 60th Congress, 1st Session, pp. 1–134, and appendix of five tables.

[3] 12 I. C. C. R. 61.

nish a shipper with cars that could not be sent beyond the termini of the originating road. The application of such a law means, therefore, that shippers would find their markets curtailed. In other words the application of such a law within the borders of a state means that shippers within that state, engaged in interstate commerce, would have difficulty in securing a fair share of railway equipment.[1]

Our early railway legislation prohibited discrimination on the part of the railways. It is equally important to eliminate discrimination which results from state regulation. Regulation by some states makes it difficult, in some cases impossible, for carriers to furnish equitable and adequate service. In the middle 70's when the Windom report was made to Congress there was a demand for low freight rates. That was natural in view of the economic conditions which obtained at that time. About ten years later the Cullom report brought discrimination in freight rates to the fore. And now within the last decade the growth of traffic beyond the capacity of the railway plant and the lack of proper control of railway service have brought the shipping public to a realization of the fact that adequate and non-discriminatory service is as important as low or non-discriminatory rates. This is reflected in the recent Esch and Pomerene Reports. Shippers appeared before the Interstate Commerce Commission in the Fifteen per cent rate case and expressed their willingness to see an advance in freight rates, in the hope that the railways would be able to render better service. From the foregoing analysis it would appear that something more is required than an increase in railway facilities. What is

[1] Aside from the extent to which such legislation interferes with interstate commerce and the free exchange of railway equipment it is easy to see how it would lead to rebating if the one receives the penalty who is supposed to be damaged by the fact that equipment is not furnished.

needed is a thorogoing control of railway service. This is necessary whether the railroads are restored to private operation, continued under some plan of government operation, or taken over by the government through government ownership.

If the railroads are to be restored to private operation our government regulation ought not compel the carriers to compete. Most students of transportation are agreed that there would be a distinct advantage in the repeal of our legislation which prevents pooling and combination among carriers, provided there be adequate supervision and control of such combinations. Those who argue for the railroads have contended that the repeal of such legislation would have made government operation of railroads unnecessary; that the breakdown was one of government regulation rather than of railroad administration.[1] If this be granted, it implies more than railroads will desire to accept. The character of railway service from about 1900 to the present time indicates that something more than mere *permission* to carriers to pool and form combinations is necessary. The repeal of the federal legislation referred to would not be sufficient. A railroad like any other business interest will combine with others when it is to its advantage to do so, but when a carrier occupies a strategic position in the use of terminal or other facilities, it is not probable that it will offer to share this monopoly advantage with other carriers. It may be to the interest of the public, therefore, not only to *permit* but to *compel* certain combinations among carriers in rendering service.[2] There is as much logic in compelling one carrier to permit the use of its

[1] See editorials in Railway Age; also Regulation of Railways by S. O. Dunn (Appleton, 1918) reviewed by the writer in Journal of Political Economy, October, 1918.

[2] See a statement by Senator Cummins, Hearings, S. 636, May 3, 1917, p. 26; see also article by Professor Van Metre, New Republic, February 2, 1918, pp. 17–20.

facilities by another carrier as there is in compelling one utility to permit the use of its poles, conduits, or other facilities by another utility. In both cases the public receives consideration as an important third party to the contract. The theory in the decision of the Supreme Court in the St. Louis terminal case (1912) ought to be more generally applied.[1]

In the regulation of railway service the Esch-Pomerene law, which became effective May 29, 1917, is but a beginning in the right direction. This legislation gives the Interstate Commerce Commission control over "car service" which term is defined by the law to include "the movement, distribution, exchange, interchange, and return" of cars used in the transportation of property by any carrier subject to the provisions of this act.[2] It is not easy to appreciate why such a law was not passed some years earlier.[3] System control of what must be inter-system equipment was too long tolerated. When the American Railway Association worked out car service rules in 1900 much emphasis was placed upon ownership as the proper criterion for the return of equipment.[4] The same theory is found in the order of

[1] 224 U. S. 383.

[2] Statutes of the U. S., 65th Congress, 1st Session, 1917, chap. 23, pp. 101–102.

[3] See a review by the writer of the Special Report of the Interstate Commerce Commission for 1917 in American Economic Review, March, 1918.

[4] The rules were presented to the Association by its Car Service Committee in April with the suggestion that the expression of the Association or of members thereof be given and that the rules with suggestions be referred back to the committee for reconstruction and recommendation to the Association in its October meeting. Rule 3 as originally presented by the committee had provided that a car should not be delivered to a second railroad without consent of owner. The Association voted that "without consent of owner" be eliminated. The committee, however, did not take this as binding upon them, and reported the rule in October "with consent of owner" inserted. Discussion at some length followed concerning the recognition which should be given to ownership of a car and the extent to which the needs of traffic and the reduction of empty car mileage ought at times to control in the exchange and interchange of equipment. By a very close vote the Association decided that the interests of the car owner should be considered first. (See Proceedings, vol. iii, pp. 161 et seq. and 251 et seq. The rules as adopted October 24, 1900 are found in Proceedings, vol. iii, pp. 279–280.) In the October meeting in 1901 amendment was made to rule 3, to permit one railroad to deliver a foreign car either loaded or empty to another railroad for switching service but that its use was to be confined to switching service and its return made either to

the Interstate Commerce Commission of January, 1917.[1] But the theory is not a sound one. Its application means much unnecessary switching, delay to shippers in securing equipment, and an undue amount of empty car mileage. It is often difficult to get cars out of congested terminals, even disregarding ownership. In the winter of 1917 the Pennsylvania Railroad Company in some instances used a crane to lift cars bodily from one track to another rather than switch them through miles of congested yards.[2] When the Railroads' War Board was created, this body modified the plan of returning cars to owners; and for some classes of equipment they simply based the number each road was to receive upon the number it owned. The United States Railroad Administration has gone further in the same direction. The economies in pooling railway equipment are clear and if the railways are relinquished to private operation after the war a plan ought to be worked out which will continue the pooling of equipment and compel each carrier to furnish its fair proportion of the total supply. The formation of separate corporations which would own all equipment and lease it to the railroads would doubtless make a satisfactory organization through which government control could be made effective. Under some such plan railroads which have not provided themselves with sufficient equipment could be held to a strict accountability.

But there is also the question of car service as it applies between railroads and shippers. This the Esch-Pomerene law does not cover except in an indirect

the home road or the delivering road. A new section (No. 15) was added to define switching service. Again amendment was offered to permit loading a car in the opposite direction of the home road. Much warm discussion followed and it was urged that this would open the door to the use of foreign cars in local service, especially in a state like Connecticut which allowed 96 hours free time. The Association refused to adopt the amendment by a vote of 18 to 28. (Proceedings, vol. iii, p. 410 et seq.)

[1] 42 I. C. C. R. 657.

[2] Testimony of Commissioner Hall, Esch Hearings, p. 17.

manner. As has been indicated there is a wide variety of practice on the part of railways in their transactions with shippers, depending sometimes upon competition between carriers, sometimes upon state legislation. When, for example, increased demurrage has been applied by one carrier, or by the carriers in one state, altho it has produced desirable results in releasing equipment more promptly, it has been difficult to maintain the advanced scale because of the lower demurrage charges of other carriers, or because of a lower scale enforced in a bordering state. This has meant unfair distribution of equipment between shippers and between states. Julius Kruttschnitt has pointed out that the average detention of equipment for a given period by consignees in Oregon was about 50 per cent greater than in California where demurrage charges were much higher.[1] It would appear therefore, that the Esch-Pomerene law will be ineffective, even within the narrow scope of car service which it is designed to cover, as long as the separate states have laws and commission rulings which are wholly independent of and inconsistent with orders which federal authorities may care to make. The commerce of this country has become so complex that intrastate regulations cannot be enforced without great detriment to the shipping public generally; and to quote the Hadley Commission "It is a matter of direct concern to the federal government that the facilities for handling commerce between the states should not be impaired."[2]

Two obstacles will be encountered in attempting to take power over railway service from the states and give it to the federal government. One of these difficulties is legal, the other is political. Those opposed to an extension of federal control will contend that the federal government has no right to exercise control over intrastate commerce, but in view of the Shreveport doctrine

[1] Newlands Hearings, p. 923. [2] Rept. Railroad Securities Commission, p. 8.

which has been set forth in a number of cases it is not probable that the legal obstacle will be insurmountable. It will doubtless become increasingly clear to the courts that state regulation of intrastate commerce is impossible without at the same time affecting materially interstate commerce. According to testimony before the Newlands Committee about 85 per cent of all traffic is interstate.[1]

The political difficulty in the way of the adoption of federal regulation of railway service is concerned with centralized *versus* local control. It will be contended that a centralized control cannot be sufficiently familiar with local conditions to be effective and efficient. There is much to be said for this objection. The United States Railroad Administration began with a Director General of Railroads. Gradually this administration has decentralized. Regions have been established, and these in turn have been further subdivided. It has apparently been realized that first hand information is important in conducting a railroad successfully. The predominance of the divisional type of organization found on American railroads is further evidence of the value of knowledge of local conditions. If there is to be control of railway service, first hand information concerning operating conditions would appear to be indispensable. How then can the disadvantage of state regulation be eliminated and yet retain the advantages which come from intimate association with actual conditions. Possibly this could be done by some plan which would permit the states to coöperate with the Interstate Commerce Commission but which would make the orders of the federal commission paramount. A better plan and one which has the support of an increasing number of students of transportation, would be to divide the country into a number of regions, something

[1] Hearings, p. 78, testimony of A. P. Thom.

after the plan of the federal reserve banking system. These regions should in size and shape conform to traffic conditions. Such regions would, therefore, ignore state lines. It would then be logical to establish commissions for these regions. State commissions would not necessarily be discontinued but could give their time to public utilities within the state; possibly they could be of value in an advisory capacity to regional commissions. It may be contended that such a proposed decentralization of regulation indicates clearly that the present decentralized plan should not be disturbed. But the present plan of arbitrary state lines, in no sense coincides with traffic needs, and regulation of railway service by the various states seriously interferes with interstate traffic. The proposed plan would be sufficiently elastic to take advantage of the knowledge of local conditions and at the same time it would be possible to work out more equitable rules and regulations affecting railway service, among railroads themselves, and between railroads and shippers.

If we assume that as a result of our experience during the war, government ownership should be adopted in the United States or that some form of government operation be continued, much of the conflict between the states and the federal government and between the states themselves would presumably be eliminated; but there would nevertheless be need of more control of railway service. It must not be forgotten that government ownership is not an aim. It is a means. Standards of service, therefore, and the machinery for carrying them out are as necessary under one system as under another, altho it is probably true that the absence of any necessity on the part of separate railroads to earn dividends might make enforcement of some of the regulations of railway service easier. If the railroads were owned

by the government or operated by it as at present it would make little difference if Great Northern cars were used to haul ice from Maine to Boston, so far as the Great Northern itself would be concerned; but there would remain the inequalities of service between the shippers of the Northwest and those of New England.

A little consideration will show, too, that government ownership or government operation would not change the situation as it affects different classes of shippers within the same state. Reference is made here especially to the one-way and two-way shippers. What this means in actual practice may be shown by a concrete case which came before the Ohio Public Utilities Commission during its two-weeks hearings on coal shortage in February, 1917.[1] A Mr. Mobley, agent for the Baltimore and Ohio Railroad at Cincinnati, was asked to testify how many cars had been ordered by a long list of industrial concerns and what proportion of those ordered had been assigned to them. To take a typical case he replied that for the month of January, 1917, a certain steel and iron company ordered 89 cars and was furnished with 372. When asked to explain why more cars were supplied than were actually ordered, he pointed out that " furnished " in his records meant the number of loaded cars sent out by that mill over his line; that the discrepancy was due to the fact that that concern received large inbound shipments daily and that they were therefore able to provide themselves with most of the empties they needed and hence they did not need to ask the railroad for many in addition. The same result is seen in many of our agricultural states where there are many important grain shipping points that get very few cars in under load yet these are the very places that need large numbers of cars for outbound grain shipments. Other places in these states more populous and more

[1] These hearings were not printed.

diversified in their activities receive more inbound freight, and hence at times there is a very unequal distribution of railway equipment between different places in these states. Finally, the same situation presents itself on a still larger scale in the unequal distribution of equipment between different sections of the country. Government ownership would not change the essential characteristics of the one-way and two-way shippers or eliminate the fundamental features of our producing and consuming areas. But in any case justice and efficiency demand that control over railway service be taken out of the hands of the railroads, the shippers and the states and given to federal authorities, so organized that they can have a knowledge of local conditions and at the same time a view of transportation problems that extends beyond the boundaries of any state or traffic area. If it be contended that such control is placing railway management in the hands of government authorities who know nothing about it, the reply is that the railroads have confessed their inability to enforce their rules either against each other or against shippers; hence the public profits little by the fact that the railroads know what ought to be done. Railroad men and shippers of long experience should, however, be utilized by the government in its control of railway service. These men should be able to make equitable rulings which can be backed by the force of law, if necessary. With proper federal control shippers in our large and congested terminals might look forward to some plan of immediate delivery of less than car load shipments and more rigid rules for disposition of car load freight. Shippers in rural districts might realize that some storage room for grain plus improved highways would not only net them a better margin of profit but lessen the difficulties for themselves and the public generally which are

annually experienced because of their attempt to market their crops within a comparatively short period of time. Railroads now admit that regulations which have been forced upon them have increased their revenue, protected them against each other, and benefited the public. It is time shippers learned the same lesson.

To summarize, there is a danger that the war will be accepted as the cause of our unsatisfactory railway service. Furthermore, the popular idea that the trouble is mainly due to car shortage is a narrow view of the question. Evidence indicates that traffic has outgrown the transportation plant; and that for more than a decade whenever business has been brisk, railway service has been inadequate and inefficient. Assuming that under a system of private ownership sufficient revenue will be allowed to carriers to enable them to provide adequate facilities or that under government ownership they would be provided by the government itself, there would remain the question of the proper use of these facilities to prevent unfairness in the one case among railway systems and under either plan to prevent injustice among different classes of shippers and among various sections of the country. In other words government operation or government ownership will not eliminate the defects of railway service which are due in some cases to the strategic advantages which some groups of shippers enjoy, or in other instances to the size of our country and its geographical division of labor. These fundamental characteristics being the same under private or government ownership, there is a need in any case of more comprehensive regulation of railway service.

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See p. 133 (note)

APPENDIX

TABLE I

CAR SURPLUSES AND CAR SHORTAGES, JANUARY 2, 1907 TO OCTOBER 15, 1914, AND FEBRUARY 1, 1915, TO DECEMBER 1, 1917

Date	Total Surplus	Total Shortage	Net Surplus	Net Shortage
1907				
Jan. 2	29,855	115,348	....	85,493
Feb. 6	12,018	149,865	....	137,847
April 10	15,037	96,154	....	81,117
May 15	21,437	55,428	....	33,991
May 29	24,945	42,970	....	18,025
June 12	32,325	40,343	....	8,018
June 26	32,859	34,458	....	1,599
July 10	58,183	20,813	37,370	....
July 24	50,954	18,753	32,201	....
Aug. 7	46,650	18,814	27,836	....
Aug. 21	40,477	22,628	17,849	....
Sept. 4	21,639	31,679	....	10,040
Sept. 18	17,251	64,920	....	47,669
Oct. 2	6,193	64,469	....	58,276
Oct. 16	4,258	85,764	....	81,506
Oct. 30	3,946	90,757	....	86,811
Nov. 13	12,201	57,003	....	44,802
Nov. 27	40,348	17,964	22,384	....
Dec. 11	119,339	4,520	114,819	....
Dec. 24	209,310	724	208,586	....
1908				
Jan. 8	341,763	653	341,110	....
Jan. 22	342,580	738	341,842	....
Feb. 5	343,928	1,100	342,828	....
Feb. 19	322,513	1,249	321,264	....
Mar. 4	314,992	1,619	313,373	....
Mar. 18	297,042	1,007	296,035	....
April 1	307,510	528	306,982	....
April 15	375,770	146	375,624	....
April 29	413,605	267	413,338	....
May 13	404,534	159	404,375	....
May 27	381,904	125	381,779	....
June 10	349,994	427	349,567	....
June 24	313,298	451	312,847	....
July 8	303,560	518	303,042	....
July 22	308,680	509	308,171	....
Aug. 5	281,621	635	280,986	....
Aug. 19	253,003	854	252,149	....
Sept. 2	222,632	1,418	221,214	....
Sept. 16	173,587	2,935	170,652	....
Sept. 30	133,792	8,114	125,678	....
Oct. 14	115,036	13,199	101,837	....
Oct. 28	110,912	10,839	100,073	....
Nov. 11	121,174	11,659	109,515	....
Nov. 25	132,829	9,210	123,619	....
Dec. 9	175,643	1,679	173,964	....
Dec. 23	222,077	1,019	221,058	....

1908 no shortages

Date	Total Surplus	Total Shortage	Net Surplus	Net Shortage
1909				
Jan. 6	333,019	506	332,513	....
Jan. 20	311,664	358	311,306	....
Feb. 3	301,571	288	301,283	....
Feb. 17	301,441	470	300,971	....
Mar. 3	299,925	685	299,240	....
Mar. 17	291,418	550	290,868	....
Mar. 31	296,600	399	296,201	....
April 14	296,663	343	296,320	....
April 28	282,328	497	281,831	....
May 12	284,479	187	284,292	....
May 26	273,890	1,240	272,650	....
June 9	277,559	285	277,274	....
June 23	262,944	827	262,117	....
July 7	260,277	530	259,747	....
July 21	243,324	339	242,985	....
Aug. 4	207,173	1,626	205,547	....
Aug. 18	159,424	2,009	157,415	....
Sept. 1	110,576	3,899	106,677	....
Sept. 15	78,798	7,425	71,373	....
Sept. 29	53,388	14,582	38,806	....
Oct. 13	35,977	23,431	12,546	....
Oct. 27	30,896	36,636	....	5,740
Nov. 10	36,616	39,902	....	3,286
Nov. 24	39,528	27,496	12,032	....
Dec. 10	57,470	18,593	38,877	....
Dec. 22	58,354	24,054	34,300	....
1910				
Jan. 5	52,309	13,893	38,416	....
Jan. 19	51,836	24,992	26,844	....
Feb. 2	51,600	26,625	24,975	....
Feb. 16	45,513	31,204	14,309	....
Mar. 2	45,315	29,907	15,408	....
Mar. 16	44,529	27,187	17,342	....
Mar. 30	45,672	19,786	25,886	....
April 13	84,887	7,530	77,357	....
April 27	102,085	5,766	96,319	....
May 11	127,148	4,555	122,593	....
May 25	115,390	4,729	110,661	....
June 8	129,508	2,729	126,779	....
June 22	125,644	3,011	122,633	....
July 6	143,824	959	142,865	....
July 20	134,594	1,293	133,301	....
Aug. 3	105,564	2,783	102,781	....
Aug. 17	78,760	5,081	73,679	....
Aug. 31	60,022	9,293	50,729	....
Sept. 14	54,890	7,814	47,076	....
Sept. 28	42,469	17,941	24,528	....
Oct. 12	33,735	20,419	13,316	....
Oct. 26	29,131	21,896	7,235	....
Nov. 9	34,581	21,000	13,581	....
Nov. 23	43,060	14,673	28,393	....
Dec. 7	53,915	11,901	42,014	....
Dec. 21	62,118	10,705	51,413	....

Date 1911	Total Surplus	Total Shortage	Net Surplus	Net Shortage
Jan. 4	110,432	3,508	106,924	....
Jan. 18	122,297	2,477	119,820	....
Feb. 1	156,355	1,287	155,068	....
Feb. 15	175,609	1,942	173,667	....
Mar. 1	192,673	2,831	189,842	....
Mar. 15	208,527	1,266	207,261	....
Mar. 29	196,217	1,330	194,887	....
April 12	187,219	1,166	186,053	....
April 26	189,524	2,518	187,006	....
May 10	188,847	1,569	187,278	....
May 24	168,233	835	167,398	....
June 7	169,006	2,204	166,802	....
June 21	165,934	2,764	163,170	....
July 5	165,508	1,887	163,621	....
July 19	150,433	1,361	149,072	....
Aug. 2	130,136	2,045	128,091	....
Aug 16	108,000	3,830	104,170	....
Aug. 30	88,866	4,325	84,541	....
Sept. 13	70,722	6,439	64,283	....
Sept. 27	58,382	8,344	50,038	....
Oct. 11	48,854	12,957	35,897	....
Oct. 25	39,306	18,774	20,532	....
Nov. 8	45,290	18,776	26,514	....
Nov. 22	43,059	19,949	23,110	....
Dec. 6	53,840	17,697	36,143	....
Dec. 20	88,646	11,832	76,814	....
1912				
Jan. 3	142,316	6,378	135,938	....
Jan. 17	102,479	12,194	90,285	....
Jan. 31	55,592	23,011	32,581	....
Feb. 14	50,886	36,928	13,958	....
Feb. 28	44,984	37,142	7,842	....
Mar. 13	46,028	42,985	3,043	....
Mar. 27	52,682	33,974	18,708	....
April 11	94,943	15,554	79,389	....
April 25	151,186	12,305	138,881	....
May 9	136,776	6,678	130,098	....
May 23	123,683	7,482	116,201	....
June 6	89,208	2,822	86,386	....
June 20	73,464	5,746	67,718	....
July 4	70,731	6,707	64,024	....
July 18	75,389	6,467	68,922	....
Aug. 1	65,904	9,394	56,510	....
Aug. 15	58,623	14,722	43,001	....
Aug. 29	36,047	26,297	9,750	....
Sept. 12	27,380	36,000	....	8,620
Sept. 26	26,754	44,547	....	17,793
Oct. 10	22,810	54,389	....	31,579
Oct. 24	17,289	67,270	....	49,981
Nov. 7	19,897	71,156	....	51,259
Nov. 21	22,363	73,475	....	51,112
Nov. 30	26,135	62,536	....	36,401
Dec. 14	26,614	61,006	....	34,392
Dec. 31	50,659	33,601	17,058	....

Date 1913	Total Surplus	Total Shortage	Net Surplus	Net Shortage
Jan. 15	53,230	24,791	28,439	....
Feb. 1	62,045	24,785	37,260	....
Feb. 15	52,700	30,517	22,183	....
Mar. 1	58,529	27,148	31,381	....
Mar. 15	57,998	20,223	37,775	....
April 1	68,792	10,804	57,988	....
April 15	70,715	13,217	57,498	....
May 1	53,977	14,178	39,799	....
May 15	61,269	10,975	50,294	....
May 31	60,291	9,383	50,908	....
June 14	71,126	7,199	63,927	....
June 30	70,740	7,036	63,704	....
July 15	76,280	6,875	69,405	....
Aug. 1	69,716	11,261	58,455	....
Aug. 15	69,253	14,828	54,425	....
Sept. 1	73,576	15,270	58,306	....
Sept. 15	61,753	21,594	40,159	....
Oct. 1	41,994	31,620	10,374	....
Oct. 15	37,198	43,246	....	6,048
Nov. 1	38,276	40,118	....	1,842
Nov. 15	46,059	23,407	22,652	....
Dec. 1	67,466	10,212	57,254	....
Dec. 15	107,513	5,968	101,545	....
1914				
Jan. 1	190,521	1,671	188,850	....
Jan. 15	217,274	2,385	214,889	....
Feb. 1	211,960	2,282	209,678	....
Feb. 14	199,385	2,333	197,052	....
Mar. 1	159,480	5,573	153,907	....
Mar. 15	132,010	7,145	124,865	....
April 1	141,525	2,013	139,512	....
April 15	213,324	455	212,869	....
May 1	230,533	1,654	228,879	....
May 15	239,406	764	238,642	....
June 1	242,572	770	241,802	....
June 15	232,994	660	232,334	....
July 1	220,875	1,333	219,542	....
July 15	228,384	1,843	226,541	....
Aug. 1	198,998	2,333	196,665	....
Aug. 15	174,260	2,115	172,145	....
Sept. 1	165,244	1,918	163,326	....
Sept. 15	138,108	2,059	136,049	....
Oct. 1	133,382	2,355	131,027	....
Oct. 15	154,342	2,360	151,982	....

Date	Total Surplus	Total Shortage	Net Surplus	Net Shortage
1915				
Feb. 1	280,573	1,162	279,411	....
Mar. 1	322,290	543	321,747	....
April 1	327,441	357	327,084	....
May 1	292,269	966	291,303	....
June 1	300,146	218	299,928	....
July 1	276,421	785	275,636	....
Aug. 1	266,312	948	265,364	....
Sept. 1	191,309	6,300	185,009	....
Oct. 1	88,351	10,010	78,341	....
Nov. 1	55,793	27,525	28,268	....
Dec. 1	60,793	23,391	37,402	....
1916				
Jan. 1	70,391	23,310	47,081	....
Feb. 1	53,611	33,312	20,299	....
Mar. 1	43,025	62,562	....	19,537
April 1	52,274	47,636	4,638	....
May 1	63,344	29,983	33,361	....
June 1	70,310	12,617	57,693	....
July 1	68,035	15,801	52,234	....
Aug. 1	49,753	39,991	9,762	....
Sept. 1	45,044	64,917	....	19,873
Sept. 30	34,157	94,854	....	60,697
Nov. 1	24,837	139,745	....	114,908
Dec. 1	21,166	128,944	....	107,778
Dec. 31	39,635	101,882	....	62,247
1917				
Feb. 1	27,069	137,057	....	109,988
Mar. 1	25,294	155,376	....	130,082
Mar. 31	19,467	164,264	....	144,797
May 1	19,026	167,653	....	148,627
June 1	23,850	130,449	....	106,649
June 30	28,669	106,351	....	77,682
Aug. 1	43,481	77,257	....	33,776
Sept. 1	50,783	85,388	....	34,605
Oct. 1	24,297	96,873	....	72,576
Nov. 1	11,293	159,787	....	148,494
Dec. 1	12,122	132,036	....	119,914

LAUGHLIN'S CREDIT OF THE NATIONS: A STUDY OF THE EUROPEAN WAR[1]

ONE of the difficulties under which the social sciences, as contrasted with the physical sciences, have always labored is the impossibility of initiating and carrying through laboratory experiments for the purpose of testing the accuracy of hypotheses. The experience of the past has been used to prove or disprove tentative theories, but these experiences often contain disturbing factors, and it is seldom possible by this means to isolate and determine the effect of a single factor, as can be done in an experiment in physics or chemistry. In the events of the present war, however, Professor Laughlin finds the needed social laboratory for the testing of theory. Never has credit been subjected to greater shocks or strains than during the present struggle; never has credit been used on so great a scale; and never have such diverse methods been used to safeguard it. Here is a wonderfully fruitful field for observation and induction, of which Professor Laughlin has fully availed himself. The working of credit in the principal belligerent countries is found to illustrate and prove the theory of money and credit previously elucidated by the author in his *Principles of Money*.

The book is divided into six chapters, of which the first describes briefly the great industrial advance achieved by all the European nations, but especially by Germany, during the thirty years prior to the outbreak of the war. Germany's remarkable industrial development provided the economic power and efficiency which made militarism possible. Because Germany was energetic and thrifty she could afford the

[1] Credit of the Nations: A Study of the European War. By J. Lawrence Laughlin, New York, 1918. Charles Scribner's Sons. Pp. xiv, 406. Price $3.50.

luxury of militarism, as Professor Veblen has put it. Add to this a colossal national ambition and the cause of the war is given. It was this dominating spirit which guided the use of the new wealth into the channels of conquest.

In the second chapter, Professor Laughlin recapitulates briefly his theory of credit, and describes its functions in time of war. Credit is based on goods. When the war began there was a sudden stoppage of trade or exchange of goods. Multitudes of persons had demand liabilities falling due, to meet which they depended upon payment by their debtors. "If not able to pay in cash, because they cannot collect, can they offer an acceptable means of payment? Here we find the crux of the whole crisis in credit brought on by the war" (p. 65). The methods used in England, France, and Germany to provide these "acceptable means of payment," to transmute uncollectible credits into immediate means of payment, are described in the next three chapters, and constitute the main thesis of the volume.

In no country was the crisis more acute than in England. Indeed, Professor Laughlin finds in her financial unpreparedness clear proof that she did not anticipate war. While the Bank of England responded gallantly to the needs of the occasion, the joint stock banks showed the white feather and curtailed their loans instead of expanding them. They had a mass of unliquid bills and tried to protect themselves. Accordingly the government suspended the bank act, proclaimed a moratorium, and authorized the issue of currency notes. Professor Laughlin concludes that neither of the last two measures was necessary and that the last was a mistake. It was not more money that was needed, but a setting in motion again of the machinery of credit. On the other hand, the means taken to maintain the gold standard, to stabilize foreign exchange, and to guarantee the Bank of England against loss from bills discounted by it (involving a possible ultimate loss to the government of $150,000,000) are all approved, as well as the policy of taxation and loans. As to the ability of Great Britain to carry the enormous indebtedness created by the war, the author entertains no doubt. Indeed

he believes the country will emerge from the conflict strengthened and awakened.

A study of conditions in France throws doubt, Professor Laughlin thinks, upon the widely heralded organization of credit in that country. Owing to the great centralization of banking in the Bank of France the responsibility of providing the necessary credit, of liquefying the assets frozen by the outbreak of war, was thrown upon that institution. This need it met by increasing its discounts and advances, both to private businesses and to the state. But the establishment of a moratorium, the suspension of specie payments, and the great increase of bank notes are held to have been unnecessary and ill-advised. There is in France a confusion of monetary and fiscal functions which contrasts strikingly with the English system and offers a warning to our country against money inflation and especially of an inconvertible paper currency. As to the ability of the French people to carry the prodigious war debt and the heavy taxation involved, Professor Laughlin concludes that they can do so " if nearly all the margin of goods produced by an energetic people over and above the necessaries of life " are devoted to this purpose.

Germany, however, offers the *abschreckendes Beispiel* in the domain of credit. Through the Reichsbank which is under strong imperial control, the joint stock banks, the loan bureaus, the municipal bureaus, and the war credit banks, it was planned to mobilize credit so as to provide every one with " cash " and avoid a moratorium. Taxation was not to be resorted to, but the necessary funds for financing the war were to be obtained by temporary loans which would be repaid ultimately from the heavy indemnities collected from the conquered nations. Both the military and financial plans have miscarried. Germany is now saddled with an enormous debt, an inconvertible paper money, a tremendous inflation of her credit, and a 50 per cent depreciation in the purchasing power of the mark. Professor Laughlin concludes that even now Germany is not solvent and that the real values behind the credits have shrunk in many instances so as to render the latter worthless. As to her ability to carry the staggering

burden of the war, he concludes that her racial characteristics will enable her to pull through and even to regain her former commercial position.

In the last chapter are described the events in the United States which preceded our entry into the war. The movements of foreign exchange, the changes in our foreign trade, our loans to Europe, and the ensuing effects upon our credit institutions are clearly set forth. Warm approval is given the Federal Reserve system and the services it was able to render.

Professor Laughlin has embodied in this volume a vast amount of careful research and has brought together in scholarly fashion a mass of scattered material. It is the more to be regretted therefore that he has thought it necessary to introduce so much that is polemical. He never loses a chance to belabor the "obsolete," the "archaic and fallacious" quantity theory of money. His interpretations of the workings of credit are colored throughout by his own theory of credit and money. But if allowance be made for the personal factor the book will be found to be the most valuable exposition of principles and repository of information which has yet been produced in the domain of war finance.

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ADAMS' AMERICAN RAILWAY ACCOUNTING[1]

THE author states in the preface that this book is a simple analysis of a standardized system of business records, and that it is designed to be helpful to three classes: (1) those who are coming to see that the truthful keeping of records is a solvent for current industrial problems; (2) accounting experts from foreign lands who may desire to learn American methods and apply them to their local problems; and (3) practical accountants, particularly the younger railroad accountants who did not take part in that nation-wide symposium of 1907 to

[1] American Railway Accounting. By Henry C. Adams. Henry Holt & Company, 1918. pp. 465.

1910, out of which emerged American railroad accounting as a standardized system, and who may find in the book an explanation of many of the rules they now apply.

Certainly no one should be better qualified to write the history of the successive steps which have brought about uniformity in railroad accounting, or to explain the reasons which underlie the rules of the Interstate Commerce Commission's accounting classifications. From 1887, when the Commission was created and given jurisdiction over accounts, until 1911, Professor Adams was actively in charge of the accounting and statistical work of the Commission, and he has left a lasting monument in the earlier accounting classifications. He gives full credit to the American Association of Railway Accountants, to whom the volume is dedicated, for their efficient coöperation, but the credit for harmonizing conflicting viewpoints during the critical period of standardization, and for making effective a workable uniformity in railroad accounting must be accorded to Professor Adams more than to any other one person.

The introductory chapter deals in the abstract with the task of the railroad accountant. " The accountant stands at the center of an organized industry; every transaction passes through his hands; every problem must receive the imprint of his mind, for it is he who supplies in concrete form the information upon which reliance must be placed for deciding administrative policies. No other single officer of a great industry is required by virtue of his official position to know as much of all the operations in all departments as the accounting officer."

Chapter 2 deals with the structure of a system of railroad accounts, defining the agencies of transportation and the accountant's definition of a steam railroad. Under the general headings of (1) construction, (2) organization, (3) operation, (4) corporation transactions, and (5) functions of ownership, the chapter contains a very helpful analysis of railroad functions.

The third chapter treats construction costs prior to operation and discusses such questions as the basis of construction

charges, cost and its relation to investment, interest and discount, and depreciation during construction. This is followed by a chapter on construction accounts subsequent to operation, additions and betterments, renewals, and abandoned property. It throws much light on the underlying reasons for the rules which apply to the division of costs between additions and betterments on one hand and operating expenses on the other hand.

The fifth chapter discusses operating expenses and summarises the philosophy underlying the grouping of the primary expense accounts. Especially helpful is the treatment of the depreciation accounts, a feature which met with strong opposition on the part of many railroads when the subject was under discussion and when equipment depreciation accruals were required by the 1907 classification. Even now there is much misunderstanding concerning the philosophy of these accounts. As between the several methods, Professor Adams favors the " straight line " plan, because it is simple, easily understood, and takes away from the management the temptation of arbitrary adjustments for the sake of making a temporary showing. As to the annuity plan, which is used by some roads to justify a low rate of depreciation charge, he points out that it cannot be assumed that the interest on the amounts set up for the charge in the first year reduces the amount of the charge for the second year unless the management actually creates a depreciation fund to balance the depreciation reserve — something which is rarely done.

In dealing with operating revenues in Chapter 6, Professor Adams is in a critical mood. As he sees it the interest of the auditor in checking revenues has had more consideration than the interest of the traffic manager (who is responsible for naming the rates and for the development of traffic) and of the public service commissions (who must pass upon the reasonableness of such rates). He believes that there should be a closer relation between the revenue accounts and the tariffs. His criticism is somewhat vague and his constructive suggestions are indefinite. One may infer that he advocates something akin to the German accounting methods (altho they are

not referred to) which divide revenues and all traffic statistics by classes, as, for example, the revenues, the tons moved and the ton miles produced under the exceptional tariffs and separately for each of the several class tariffs. The same principle is applied to German passenger accounting. The published reports show the number of passengers, the passenger miles, the revenues, the revenue per passenger and per passenger mile, and the average journey for each of the four classes and for military passenger traffic, with a segregation of suburban passenger traffic. The revenue classifications of the Interstate Commerce Commission do not now require, and never have required, the subdivision of traffic statistics by classes. It may be inferred further that Professor Adams has only recently formed the conclusions set forth in his book, or that either he was not thoroly convinced as to their practicability and desirability when he had charge of the accounts or that he then lacked support in promulgating the revenue classifications accordingly.

In a somewhat guarded manner he calls attention to the fact " that current administrative and judicial opinion looks upon the determination of a reasonable rate as a function of operating expenses," and he takes occasion to deplore the tendency toward the " cost of service " theory. His fundamental criticism is that the relation of railroad rates to the industrial development of the nation finds no place in the cost theory of rates. He fails to make clear, however, the basis for his statement that the development of the revenue classification has been hampered by the cost theory and that that theory is responsible for " the indifference of traffic officials, and the relatively inferior grade of commercial intelligence commonly secured for service in the traffic department."

The remaining three chapters relate to the income, profit and loss, and the general balance sheet accounts. They are helpful and illuminating, altho treated broadly rather than in detail.

On the whole it would seem that the book is of greatest value to the first class of reader to whom it is addressed, namely, the professional accountant and the economist, who

are interested in the broad philosophical discussion of accounting principles and in the analogy between railroad accounting and industrial accounting. The style is somewhat labored. In many places throughout the volume the meaning would be clearer and the message would be more effective were the thought stated in less involved phraseology.

In one respect the book may be disappointing to railroad accountants who may expect to find something more than the volume contains. Knowing of Professor Adams' intimate connection with the development of the accounting classifications, they may look for a more personal tone than the author has assumed, or for interesting historical sidelights on many moot points and for reasons for reversal of policy and practice. For example there is no reference to the subject of a division of expenses between the freight and passenger services, altho such a division was required by the first classification of operating expenses issued by Professor Adams. After an experience of a few years the requirement was withdrawn, to be renewed after Professor Adams had left the Commission. His opinion on the advisability of charging out depreciation on physical structures as well as on units of rolling stock is not given, and there are some troublesome points in connection with accounting for additions and betterments (such as the Kansas City Southern case) which the railroad accountant would like to see discussed.

The book contains 465 pages of which 273 are devoted to reprints of existing classifications which are, or should be, in the hands of all of the three classes of reader mentioned in the preface. These classifications are public documents obtainable at nominal prices, and there appears to be little justification for reprinting them in this volume. The same criticism, however, applies to other volumes on the same subject — Eaton, Hooper, and Sykes. The majority of readers would be more interested if the pages devoted to the lengthy appendices were used to throw further light on obscure or controversial points in the individual accounts.

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NOTES AND MEMORANDA

ORGANIZATION OF AMERICAN RAILROADS UNDER GOVERNMENT CONTROL

On December 31, 1916, there were 2905 railroad companies in the United States, operating 185 major systems, 221 switching and terminal companies, 1434 plant facility roads, and 765 so-called " short line " railroads. A momentous era in the organization of the principal lines opened on December 26, 1917, when the President took control and placed under the authority of Director General McAdoo the roads considered an essential part of the transportation system of the nation. Since that time, many of the plant facility and short line railroads have been released from federal control. The roads retained are being operated as one system, a method impossible under laws governing the railroads when they were under private control.

Changes by which this new order has brought about, have been far-reaching in character, but have been put into effect with such consideration for existing organizations that there has been no confusion. Every change has been made with due regard to actual conditions and has been brought about to effect practical reforms rather than to carry out theoretical preconceptions. The results already achieved have proved that most of them were to the advantage of the railroad themselves, as well as to the shipping and traveling public.

The disadvantages of the competitive operation of the railroads, at least in war times, are self-evident. Take the question of the routing of freight and passengers alone. Where it was to the financial advantage of every road to carry as much traffic as possible, it was manifestly impossible to always haul freight by the shortest routes or to take advantage of the best

grades. In many cases, because of competition, passenger trains of competing roads, each frequently but partially filled, left the same point at the same time and arrived at the same destination at the same time, altho economy and efficiency of operation would naturally require that each train carry a full load and leave at a different time. The same is true of terminals and ticket offices. Plainly it is in the public welfare to have consolidated terminals and consolidated ticket offices wherever possible.

The first act of the Director General of Railroads, after taking control of the railroad systems of the United States under order of the President, was to issue instructions that all officers and employees should continue in the performance of their regular duties, reporting to the same offices as previously. The railroads were placed under federal control in the midst of unusually severe weather conditions, and the primary duty facing the Railroad Administration was to meet this situation. Until the severity of the winter abated every energy of the Railroad Administration was directed to the sole object of moving coal and other necessary war material.

On January 18 the Director General divided the country, from a railroad standpoint, into regions — namely, the Eastern, Southern, and Western Regions, placing an experienced railroad man in charge of each, and giving instructions that "orders issued by the gentlemen named in their capacity or Regional Directors, will be issued by authority of the Director General, and will be respected accordingly." Since that time, and for the purpose of better administration, four additional regions have been added, and at the present time the railroad mileage of the country has been divided as follows:

1. The Eastern Region, A. H. Smith, Regional Director, New York, comprises the lines located chiefly in the New England States, in New York State, in the northwestern portion of Pennsylvania, and in Ohio, Indiana, and Michigan.

Some of the more important lines included in this region are the New York, New Haven and Hartford; the Boston and Maine; the Boston and Albany; the New York Central; the Nickel Plate, the West Shore, the Delaware and Hudson; the Lehigh Valley; the

Delaware, Lackawanna and Western; the Baltimore and Ohio west of Pittsburgh; the Pennsylvania west of Pittsburgh, and the Buffalo, Rochester and Pittsburgh.

2. The Allegheny Region, C. H. Markham, Regional Director, Philadelphia, comprises the lines located chiefly in the state of Pennsylvania, the northern part of West Virginia, and some of the lines traversing Maryland and New Jersey. It also includes the Long Island lines as an extension of the Pennsylvania road east of Pittsburgh.

Among the more important lines in this region are the Baltimore and Ohio, and the Pennsylvania lines east of the Ohio River; the Bessemer and Lake Erie; the Central of New Jersey; the New York, Philadelphia and Norfolk; the Philadelphia and Reading, and the Western Maryland.

3. The Pocahontas Region, N. D. Maher, Regional Director, Roanoke, Va., contains most of the east and west lines traversing Virginia and West Virginia and a certain portion of the mileage penetrating the coal fields of Kentucky and southern Ohio.

Among the more important lines in this region are the Chesapeake and Ohio east of Louisville, Columbus, and Cincinnati; the Norfolk and Western, and the Virginian, including the terminals of all railways at Norfolk, Portsmouth, and Newport News, Va., and the Norfolk and Portsmouth Belt lines.

4. The Southern Region, B. L. Winchell, Regional Director, Atlanta, Ga., includes most of the north and south lines, traversing the territory south of the Ohio and Potomac Rivers and east of the Mississippi River.

Among the more important lines in this region are the Atlantic Coast Line, the Seaboard Air Line, the Southern, the Norfolk Southern, the Louisville and Nashville, the Florida East Coast, the Central of Georgia, the Alabama Great Southern, and the Illinois Central lines south of Cairo, Ill.

5. The Northwestern Region, R. H. Aishton, Regional Director, Chicago, contains most of the mileage running west and northwest of Chicago and Kansas City to and toward the Pacific coast. Generally this mileage traverses northern Illinois, Wisconsin, Minnesota, northern Iowa, northern Nebraska, North and South Dakota, Wyoming, Montana, Oregon and Washington.

Among the more important lines included in the Northwestern region are the Chicago and Northwestern; Chicago, Milwaukee and St. Paul; the Chicago Great Western; the Great Northern; the Minneapolis and St. Louis; the Northern Pacific; the Minneapolis, St. Paul and Sault Ste. Marie; the Oregon-Washington Railroad and Navigation Company, and the Southern Pacific lines north of Ashland, Oregon.

6. The Central Western Region, Hale Holden, Regional Director, Chicago, comprises the lines running in a southwesterly direction from Chicago and Kansas City to and toward the Pacific coast. The mileage of this district traverses the states of Illinois, southern Iowa, northern Missouri, Kansas, Nebraska, Wyoming, southern Idaho, Colorado, New Mexico, Utah, Arizona, Nevada, and California.

Among the more important lines in the Central Western region are the Union Pacific; the Atchison, Topeka and Santa Fe; the Chicago, Rock Island and Pacific, excepting that portion of its lines that are included in the Southwestern District; the Chicago and Alton; Chicago and Eastern Illinois; the Chicago, Burlington and Quincy; Colorado and Southern; the Northwestern Pacific; the Oregon Short Line; the Southern Pacific lines west of El Paso and Ogden except north of Ashland, Oregon; the Western Pacific; and the El Paso and Southwestern.

7. The Southwestern Region, B. F. Bush, Regional Director, St. Louis, includes most of the lines south of the Missouri River running generally southwest and traversing the states of Missouri, Arkansas, Oklahoma, Texas, and Louisiana west of the Mississippi.

Among the more important lines in this region are the International and Great Northern; the Kansas City Southern; the Missouri Pacific System; the Missouri, Kansas and Texas; a certain portion of the Rock Island lines; the St. Louis and San Francisco; the Texas and Pacific; the Wabash lines from St. Louis to Kansas City and Omaha; the Gulf, Colorado and Santa Fe; the Fort Worth and Denver City; the Southern Pacific lines east of El Paso; and the Texas and New Orleans lines.

Under these Regional Directors have been appointed District Directors in charge of subdivisions of the Regional Districts.

In the division of the country into regions, little attention has been paid to state lines. The controlling idea has been to assemble under the management of one Regional Director the larger portion of the railroad mileage serving his territory. As a result of this arrangement, parts of several of the largest systems have been put in different regions. Since the regional division of the country and the allocation of lines and Federal Managers, there have been a few changes, once it has been decided that efficiency would be increased thereby. The system is in the process of evolution and probably there will be more changes later, altho, generally speaking, it seems likely that the present division is practical, and is achieving the desired results.

Until May 21, 1918, railroad corporations and the corporate officers were employed as the instrumentalities through which the Director General operated the properties. But at that time he decided to have operations conducted through agencies responsible exclusively to him, and therefore, the corporations were detached from any connection with operations, and the operations were put in charge of Federal Managers, and in the cases of smaller lines in charge of General Managers. Some of the officers of the corporations were requested to serve the government, and others were cut off the government payroll, altho most of those so cut off continue to serve the corporations with which they had been previously connected. Under the present system, every railroad officer in the country is without divided responsibility; all are responsible solely to the Director General. The wisdom of this course was shown when the time came to consummate contracts between the government and the railroad corporations. In that process the corporate officers were left free to represent their stockholders without any embarrassment to themselves or to the Railroad Administration. Those who accepted positions under the government had to sever all connection with the corporations. At the same time continued effort has been made to build up a spirit of coöperation between the Railroad Administration and these corporate officers representing the owners of the properties being operated by the government.

Thus the railroad organization under government control is seen to be a pyramid, with a great mass of railroad employees forming the base, the pyramid tapering up through the Federal and General Managers, then through the Regional Directors, and finally to the Director General who forms the apex of the pyramid.

Gathered about the Director General in Washington is a staff consisting of an Assistant Director General, Assistant to the Director General, a private secretary to the Director General, and Division heads having to do with the principal railroad activities. There is a Division of Finance and Purchases; a Division of Operation; a Division of Law; a Divi-

sion of Capital Expenditures; a Division of Labor; a Division of Traffic; a Division of Public Service and Accounting, and a Division of Inland Waterways, formed to manage the operation of canals, etc., included as a part of the transportation system of the nation. There is also a Railroad Administration Actuary, under whom is a Bureau for Suggestions and Complaints and other activities. The force of these divisions and of the Director General's immediate office has been kept at a minimum. The theory has been that the staff in Washington originates general policies and leaves their execution to the Regional Directors, the Federal and General Managers, and the regular officials and employees. Every effort has been made to weld these previously distinct organizations into a homogeneous whole, and this work has already progressed far.

It is not feasible to measure at this time the tangible results which these changes in organization have brought about. It is enough to say that already there have been intensive unifications of terminals and of stations; unnecessary passenger trains have been eliminated; there have been intensive reductions in organizations; a uniform freight classification has been adopted; competition as between systems and roads has been done away with, leading to many economies and simplifications; time tables have been made more simple; a universal mileage book for use on all lines under government control has been adopted; freight routes have been shortened, resulting in a development of well-graded routes for the transportation of freight, a reduction in the cost and time of transportation between many given points, and the intensive employment of both rolling stock and the equipment of the railroads; successful efforts have been made to produce better loading of freight cars and the more intensive use of railroad equipment generally.

A successful standardization of freight cars and locomotives has been brought about, thus simplifying the work of repair and making it more convenient for the equipment of one road to be used on all other roads. A supervision has been initiated and exercised from Washington over capital expenditures for improvements and betterments, so that the labor and material

supply, which is limited under war conditions, can be allocated where most needed and the railroad situation surveyed from a national standpoint rather than from that of the individual systems and lines. A uniform system of purchases has been instituted, leading to economy; the Pullman Company has been placed under the jurisdiction of a separate Federal Manager, and thus made an integral part of the Railroad Administration.

Effective coöperation has been built up between the Railroad Administration and other governmental agencies with an interest in transportation matters, with the result that efficiency has been increased in the transportation of troops and supplies needed, not only for our own army and the armies of our allies, but by the civilian population as well. The Railroad Administration has a traffic representative with the War Industries Board, the War Department, the Navy Department, the Shipping Board, the Food Administration, and the Fuel Administration. Traffic questions having to do with these organizations are handled by these Railroad Administration representatives. Another example of coöperation has been the creation and operation of the Exports Control Committee, of which a representative of the Railroad Administration is Chairman, and on which serve representatives of other government agencies interested in export problems. The duty of this committee is to so control traffic as to avoid congestion at export points.

In addition to the railroads under the control of the Director General there are a number of coastwise steamship lines including the vessels of the Clyde Steamship Company, the Mallory Steamship Company, the Merchants and Miners Transportation Company, and the Southern Steamship Company. Successful efforts have been made to synchronize the operation of these lines with the operation of the railroads of the nation in the carrying of freight and passengers.

On September 3 the Director General of Railroads made a report to the President on the work of the United States Railroad Administration for the first seven months of its existence, and in that report details were given of the way the

multiplex problems which have arisen have been solved. In general, a conservative view at the present time is that the primary work of changing from many railroad systems into one system has already been accomplished. As time goes on, improvements and changes may be expected. The organization for carrying forward this vitally important part of the war endeavor of America is now at hand. For it to forge forward only needs intensive work on the part of all members of the great organization from top to bottom, and a constant study of the possibility of reforms as well as the execution of plans already made.

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THE BEHAVIORISTIC MAN

A NEW kind of an economic man has been, or is in process of being, constructed by what is known as the behavioristic school of economists. He is the result of an over-emphasis upon the non-pecuniary and the neglect or under-emphasis upon the pecuniary motives, as the old economic man was the result of the opposite tendencies.

There can be no doubt that men have many instincts and impulses which ally them with the bower bird who contrives, the beavers who construct, the bees and squirrels who accumulate, and all gregarious creatures who work together without thought of pecuniary gains and losses, and without calculating and balancing costs and advantages of any kind. We must all acknowledge the importance of a study of the instinctive and impulsive reactions in economic life, and admit the charge that too little attention has been given to them by economists. On the other hand, a counter charge can be made with equal effect and with equal justice against the so-called behaviorists. There are three counts in this charge.

1. They fail to see that the so-called orthodox economists have made ample allowance for these instincts, impulses and

emotions, even tho they have not analyzed, described and catalogued them as fully as was desirable.

For example, in most recent theories of interest, allowance is made for instinctive saving, accumulation, storing, holding on to desirable possessions, etc. In addition to all these things, however, these theorists have claimed that the influence of calculated self-interest shows itself. A great deal of saving would take place, it is claimed,[1] even if there were no prospect of receiving interest on accumulations; but, nevertheless, some people are induced to save more when interest is added as another inducement than they would save because of these instinctive motives alone, when there was no prospect of interest. The added savings of these people who look forward to interest make up an appreciable part of the total supply of capital in any economically advancing community. Patriotism, also, and other non-pecuniary motives play a part, but it seems probable that more would be subscribed for government bonds which paid interest than for those which did not.

2. The second count in the charge is that the Behaviorists have gone as much too far in one direction as the orthodox economists have ever gone in the other direction, in that they have ignored, or at least slurred over, calculated self-interest as a factor in human behavior. If the so-called economic man of the classical school, whom, by the way, I have found described by the opponents of the classical school more specifically than by any member of that school, was too much of a calculating machine, so is the " behavioristic man " of this recent school too much of an impulsive, unreasoning, " eternal feminine " sort of a man. It seems to me that we need a balancing up of motives before we arrive at any true concept of human reactions in a modern economic society.

3. The third count in the charge is that the behaviorists, like some of the older economists, lay too much stress on the

[1] Cf. the chapters on Interest in the present writer's Distribution of Wealth; also the chapter on Self-Centered Appreciation in his Essays in Social Justice; Marshall, Principles of Economics, Bk. VI, chap. 6; Landry, L'Interet du Capital, chaps. 2 and 3; Cassel, The Nature and Necessity of Interest, chaps. 2–4; Fisher, The Rate of Interest, chaps. 12–14; Mixter, Theory of Savers' Rent, Quarterly Journal of Economics for April, 1899, pp. 245–269.

question as to what men are really like and, relatively at least, too little upon the great selective principles of economy. The question is not simply what are men actually like, but what kind of men fit best into the cosmos. What are the earmarks of a "good" man, that is, of a man who adds strength to the community or the nation? The same charge may be brought against the behaviorists that is brought against the anthropological school of moralists. It is not enough that we study the variations of human institutions, habits, morals, etc. We also want to know what institutions, habits, and moral systems work well. What kind of a nation or social organization fits in the cosmos and grows strong under the conditions of the universe. Similarly, as to individual motives, it is not simply a question as to what motives actually govern human behavior, tho it is important that we know that. It is of equal importance that we know what motives or combinations of motives work well. If we permit ourselves to use the word "ought," we want to know what motives ought to dominate. What happens, to take an extreme case, to farmers who do not save seed or accumulate capital? Is a thriftless man as strong a man, or a thriftless nation as strong a nation, as a thrifty one?

There is variability here as elsewhere. Individuals are not all exactly alike. Some are governed more largely than others by a given group of motives, others by a different group. This gives the variability which is the opportunity for selection. Which combination of motives makes the best citizen, that is, the one most useful to the group or the nation?

It is my present belief that observers and students of human behavior reach different conclusions according to the kind of people whose behavior they are studying. He who studies mainly the failures, that is, those persons who have not succeeded in fitting themselves very well into the great industrial and social organization, will reach one conclusion as to the motives which dominate in human behavior. He who studies the more favorable variations, that is, those persons who have succeeded somewhat better in fitting themselves into the whole, reaches another conclusion.

A parallel line of division is found among students of the question of the relative influence of heredity and environment as determining factors in individual success. By analogy, if one were studying jellyfish, one might find them to be the sport of circumstances, the winds, the waves, the tides and the currents. Environment seems to be everything until one asks, why were they jellyfish; then heredity comes in. A human weakling likewise seems to be the sport of circumstances. If they are favorable, he turns out well; if unfavorable, he turns out badly. Again, environment seems to be everything, until one asks, why is he so weak as to be the sport of circumstances. Then heredity has at least to be considered. If one studies sharks, however, one does not find them to be the sport of circumstances, at least not of the same circumstances as those which control the jellyfish. What is the difference? It is partly that one was born a shark and the other a jellyfish. Two men go into a shower bath. One comes out with a glow and the other with a chill. To the one a cold shower bath was favorable, to the other it was unfavorable. The difference is in the men. Two men grow up in a slum environment. One comes out sound, strong and virile; the other diseased, weak and parasitic. Why did they turn out differently?

As to the relative importance of the so-called rational and non-rational factors in human behavior, there is no reason to believe that all men are alike in this or any other particular. It may be that successful men are influenced somewhat more by the rational factors than are unsuccessful men. At any rate, the classical school with its so-called economic man was as truly a behavioristic school as any group of recent students. They were studying a different class of men in the industrial system. Perhaps both schools develop a one-sided theory of human nature because of the fact that each is studying a different class — one the successful, the other the unsuccessful class.

This has an important bearing on the question before us. There is no a priori reason for concluding that one kind of man is better than another, certainly not for concluding that a

non-calculating, impulsive man, whose economic reactions are wholly instinctive, is better than one who calculates and carefully compares costs and advantages. The latter is certainly more "human," if by that word we imply the possession of qualities which distinguish us from, rather than ally us with, the loveable brutes. After all, calculating costs and advantages seems to work well, or at least better even from the social point of view, than "going it blindly," or relying upon our instincts and impulses, however admirable these may be. The investor, for example, who calculates carefully whether a certain enterprise will pay or not is really, in the last analysis, calculating whether the utilities resulting from it will be greater or less than those destroyed or wasted in carrying it through. A nation which encourages this kind of calculation on the part of its citizens is more likely in the long run to prosper than the nation which does not.

It is the writer's opinion that "behaviorism" fits into the classical scheme of economics, and fills it out by furnishing detailed analysis and description where they were lacking before. In this respect it performs the same function as that performed a generation ago by the marginal utility theory. This was not revolutionary, tho some ardent souls who did not see where it fitted in thought, for a time, that it had scrapped the whole classical system. On the contrary, it merely furnished an analysis of demand comparable with the analysis of supply which the classical school had worked out. The behavioristic school is furnishing a detailed analysis and description of a group of factors which were taken for granted by the marginal utility and marginal productivity analysis.

In the theory of differential cost, for example, it has long been understood that cost is disinclination, and that the disinclination is not a fixed and unvarying thing. There is no absolute disinclination to work, to risk or to save. Much work is done for many reasons besides the hope of wages, much saving without the hope of interest, much risking without the hope of profits or other objective gain. There is room here for the "instinct of contrivance," for a squirrel-like impulse to hoard, for the pleasure of skating over thin

ice, or telling *risqué* stories. A study of these will add to our knowledge of what may be called "costless" production or production inside the margin. What are all these non-pecuniary motives? There is a large question here; and if the behaviorists can answer it in detail, they will have made a significant contribution to economics. But if they think that they have built up a complete system and can dispense with all that has gone before, they must be placed in the class with men in other fields, such as chemistry, physics, medicine, or zoölogy, who, because of some new observations, hasten to announce that all previous work is of no account.

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THE REVIEW OF ECONOMIC STATISTICS

The Harvard University Committee on Economic Research will begin in January, 1919, the publication of a review devoted to economic statistics. The Committee has had this project under consideration for nearly two years, and in the fall of 1917 engaged Professor W. M. Persons, of Colorado College, to undertake the study of methods of interpreting current economic statistics. Professor Persons is well known to the scientific world through the various papers he has published upon statistical methods and results, and he will have editorial charge of the new publication, which will appear quarterly. The purpose of the committee is to promote the collection, criticism, and interpretation of economic statistics with a view to making them more accurate and valuable than they are at present for both business and scientific purposes. This, it believes, can be done by more thoro investigation of the sources and accuracy of statistical data, and by developing the application to economic statistics of modern methods of statistical analysis, which have hitherto been utilized more extensively in other sciences than in economics.

It is the hope of the committee that the proposed publication will, in due time, provide a more accurate record of economic phenomena than is now available, and will also supply a method of interpreting current statistics which will make them more useful and significant than they are today. Since many new scientific and technical problems will necessarily be encountered, the 1919 issues will be treated as a preliminary volume, and will not constitute the first volume of a permanent series. The review will be published in connection with a statistical service which the Committee on Economic Research proposes to establish. The cost of the undertaking precludes ordinary publication arrangements, and, therefore, the review will be supplied only in connection with the statistical service which is offered for the year 1919 to all who may desire to become subscribers at the price of $100 per subscription. Besides the review, it is expected that statistical service will include, after April or May, a monthly bulletin supplementing the quarterly publication. Since the purpose of the enterprise is primarily scientific, the quarterly publication will be supplied, without charge, to a limited number of university libraries and to scientific investigators particularly interested in the problems with which it will deal.

The Committee on Economic Research consists of Charles J. Bullock, Chairman, Charles F. Adams, Nicholas Biddle, Frederic H. Curtiss, Wallace B. Donham, Edwin F. Gay, Ogden L. Mills, Eugene V. R. Thayer.

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THE

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OF

ECONOMICS

FEBRUARY, 1919

PRICE-FIXING AS SEEN BY A PRICE-FIXER

SUMMARY

The three agencies that regulated prices, 205. — Differences in their methods, 206. — The Price-Fixing Committee, 209. — Commodities regulated by the committee, 209. — Ground for their selection; heavy government needs, 210. — Prices were fixed as maxima only, 214. — Gradual elaboration and extension, 214. — Cost of production as the basis, 216. — Marginal, or "bulk-line," cost, and charts illustrating it, 218. — This basis of price-fixing justified by economic theory, 222. — Distinction between differences in cost based on physical causes and those based on human qualities, 222. — The real ground for stress on marginal cost was necessity of maintaining output, 228. — Special phases of some articles, lumber, cement, iron and steel, 229. — Proposals for an average or pooled price, 232. — Objections to this method, 233. — Conclusion, 238.

PRICE-FIXING during the war period was carried on by the government through three agencies: the Food Administration, the Fuel Administration, and the Price-Fixing Committee of the War Industries Board. The first two were the earlier; they came into existence through the act of August 10, 1917, commonly known as the Lever Act. The Price-Fixing Committee, to whose doings attention will mainly be given in the following pages, was of much later date. The President created it on March 14, 1918, as a Committee of the

War Industries Board. Its functions were independent of those of the Board, and it had authority to report directly to the President himself.[1]

Both Fuel Administration and Food Administration had from the start well-defined objects and well-defined limits. In some respects their scope was wider than that of the Price-Fixing Committee, in other respects narrower. It was narrower in that their jurisdiction, as the titles indicate, was strictly limited as regards commodities — fuel and food only. On the other hand, it was wider in that they followed the articles all the way from producer to consumer. Both undertook to regulate not only producers' prices, but the prices of wholesale and retail dealers also. Hence they immediately established large administrative forces, and dealt with problems in many ways more intricate than those of the Price-Fixing Committee.

As regards the principles followed, on the other hand, the Food Administration stands in many respects apart from the other two. While it aimed, like the others, at securing fair prices and limiting profits to fair rates, the rates were fixed in most cases on a somewhat rough and ready basis, usually with regard primarily to a normal or customary percentage of return. The Fuel Administration and the Price-Fixing Committee made more systematic use of cost figures and cost accounts. It is by no means clear that their resort to elaborated cost figures led to more satisfactory results; but these figures raised general problems of a kind familiar to and not without instruction for economists.

[1] The members of the Committee were: Robert S. Brookings (Chairman); B. M. Baruch, chairman of the War Industries Board; William B. Colver, chairman of the Federal Trade Commission; F. W. Taussig, chairman of the United States Tariff Commission; H. C. Stuart, chairman of the Agricultural Advisory Committee; Hugh Frayne, representing labor; H. A. Garfield, Fuel Administrator; R. H. Montgomery, representing the War Department; John M. Hancock, representing the Navy Department. R. V. Norris served as representative of the Fuel Administration during the later sessions of the Committee.

Moreover, as regards one conspicuous item — wheat, and flour so far as resting on wheat — the basis of regulation by the Food Administration was different from that for any other commodity. Congress virtually took the matter out of the hands of any administrative or investigative body, and settled it once for all, by enacting an unqualified guarantee for the price of wheat. That became a minimum price; whereas in all other cases the price regulations took the form of fixing a maximum only. The Lever Act guaranteed a minimum price of $2.00 for the crop of 1917–18 (that is, the crop which would begin to come to market on June 1, 1918). The minimum was later raised, under the discretionary power left to the President, to the sum of $2.20 for that crop. The Wheat Committee of 1917, it will be remembered, had fixed this same price, $2.20, for the crop which was being marketed in 1917. And the same price, as is well known, has been extended to the crop of 1918–19, still to come. The case was unique and remains unique. The figure of $2.20 was reached by no careful cost inquiries or statistical computations, but in consequence of an almost precipitous desire to increase the wheat supply and also to placate the farmers. Its extension to the crop season of 1918–19 is likely to trouble Congress and the country for some time to come. In many ways the wheat episode stands by itself, quite separate from the other price-regulating experiments.

Another distinction between the several agencies needs to be borne in mind. Both the Fuel Administration and the Food Administration had for their first and primary object the protection of the public. The Price-Fixing Committee, as will presently be explained more fully, started with the design of protecting the government, and extended its function, but gradually and

slowly, toward the protection of the public also. Unlike the other two, it never extended its regulations to retail dealers and indeed in no appreciable degree to wholesale dealers. How far it might have been compelled to go in this direction had the war lasted much longer, is an open question. As matters turned out, its scope, however wide-ranging as regards the articles affected, was limited as regards the stage at which transactions were controlled. For this reason it had no large administrative machine, no great staff of officials and clerks, no enormous correspondence.

By way of further preface, it may be noted that in still another important respect there was a difference between the Food Administration and the Fuel Administration on the one hand, and the Price-Fixing Committee on the other. This was in their legal position. The legal weapon was strongest in the hands of the Fuel Administration, sufficiently strong for the Food Administration, but of very uncertain efficacy for the Price-Fixing Committee. The Fuel Administration had direct power under the Lever Act to fix prices. The Food Administration had an effective lever of control through its licensing power. Altho not authorized by law to fix prices, or to require from anyone the direct observance of any scale of prices, it had unlimited power to license producers and large dealers, and to withdraw licenses; and by the exercise of that power could bring recalcitrant persons to submission. The Price-Fixing Committee's legal position, however, was highly uncertain. The only weapon which the law clearly put into its hands was that of turning (by recommendation) to the President's power of commandeering supplies or a plant, the owner being then left to proceed in the courts, if so disposed, in order to secure a " fair price." There was also a possibility of further pressure through recourse to

the Railroad Administration and through the application of transportation priorities in favor of persons who conformed to its instructions.

But the legal powers of the Price-Fixing Committee, applicable at best only to articles needed for the use of the government, were of much less practical consequence than public opinion and patriotic spirit. The universal feeling of support to public authority in every step taken in connection with the war was the effective basis of its action. In fact, no occasion ever arose for putting to a test the nature or extent of its legal authority. The prices fixed were in all cases reached by agreement with the representatives of the several industries. In strictness they were agreed prices rather than fixed prices. The agreements were usually reached in cordial coöperation with the producers concerned, and thus were in reality voluntary. There were cases, however, in which they were agreements only in name. The representatives of some industries, tho they accepted them, did so virtually under duress. In these cases the Committee to all intents and purposes decreed prices, and was enabled to impose them, under the form of agreement, by a more or less veiled threat of commandeering, and also by the certainty that public opinion would condemn those who failed to accede.

The commodities which came within the purview of the Price-Fixing Committee constituted a long and heterogeneous list. It included not only important staples like iron and steel, copper, lumber, wool, hides and leather, cotton fabrics, nitric and sulphuric acid, but also articles of less quantitative importance, like nickel, aluminum, quicksilver, zinc, brick, cement, hollow tiles, crushed stone, sand and gravel. Some account of the mode in which several of the articles were dealt

with has already been given in these columns.[1] It is not the purpose of the present article to consider these in further detail or indeed to consider in detail any among the commodities dealt with. Its purpose is rather to consider some general aspects of the situation and some economic principles involved or supposed to be involved.

The explanation of this great variety of articles — the connecting link between them — is found in the circumstance that all were needed in great quantities by the government. The action of the Committee in every case had its origin in the circumstance that government purchases were on a great scale and threatened to disturb market prices. The extension of the function of the Committee to the regulation of prices for the public was, if not an afterthought, at all events not among the things contemplated at the start. The Committee stepped in when government purchases threatened to upset the market, but soon found itself compelled to protect the public also.

For this sort of action, and for this ground of selecting the price-regulated commodities, there was a sound basis in economic principle. Where government purchases are on such a scale as to absorb a very large proportion of the available stock or accruing output, the ordinary formulae of supply and demand are no longer applicable. When a government buys for war purposes, it is desperately determined to secure what it needs irrespective of price. To put the case in technical terms, demand is virtually inelastic; the demand curve is almost perpendicular; there is no such thing as a determinate equilibrium price. This is the explanation of the soaring of prices, the wide and abrupt fluctuations, the speculative shifts, the quick response to rumors of gov-

[1] See the articles on sugar, iron and steel, perishable produce, wheat and flour, and copper, in the issues of this Journal for August and November, 1918.

ernment policy. The tendency to a runaway and unpredictable market becomes still more marked if there happen to be several government agencies bidding against each other. Such was the situation, as has already been pointed out in these columns [1] when the representatives of the belligerent allies bought wheat in the American market in the spring of 1917. Such too was the case when they were buying steel plates in 1916–17. So, again, when they were buying munitions and ordnance supplies from American manufacturers on terms which caused the derived demand by these manufacturers for iron, copper and coal to become virtually inelastic. The munition contracts were so profitable that the makers were almost indifferent to the prices they might pay for their supplies. At almost any price it was profitable and imperative to secure the needed materials.

And this too was the situation when the United States itself stepped into the war. Almost the entire supply of many important articles was wanted for government use — partly by the United States government itself, partly by contractors working for the government, partly by the Allies. The extent of the indirect demand (from contractors) was not always known; but it played a great part, and was of essentially the same character as that of the government itself. When things were at their height the total non-private demand for iron and steel absorbed 85 per cent to 90 per cent of the tonnage. This was the maximum; but at no time between the autumn of 1917 and the autumn of 1918 was the demand for less than 60 per cent. For copper the proportions of maximum and minimum demand for public use were no less. Nine-tenths of the nickel was taken, dur-

[1] See the discussion of wheat prices in 1917, by W. Eldred, in this Journal for November, 1918, p. 1.

ing the war period as a whole, for government and Allies' use, and at least as much of the aluminum. For other commodities the requirements, tho not such as to dominate the market completely, were yet so great as to threaten to demoralize it. During the war period half of the zinc and half of the quicksilver were taken for government use. Of the coarser cotton fabrics, as much as 60 per cent was at one time taken by the government; of the country's entire output of cotton manufactures, as much as 30 per cent. For southern pine lumber the government's demand, through the entire period of war, was for more than a fifth of the cut, and during the summer of 1918, when the peak was reached, for more than a third. For spruce and fir (Washington and Oregon) the proportion of the whole was less; but certain sizes suitable for ship-timbers, and certain kinds suitable for aircraft, were completely taken over, and the " side-cut " from these became an almost dominant factor in the commercial market. Of sulphuric acid, nearly 40 per cent was taken when things were at their height; and of nitric acid as much as 65 per cent. In particular localities where the government, directly or through contractors, was engaged in great dock and harbor operations there was a demand for all the sand and gravel available, and hence an occasion for price-fixing even on these out-of-the-way articles.

The conditions under which the government demand appeared were not always the same. Usually purchases were made partly by the Army Quartermaster or other government department, partly by the Allies, partly by contractors engaged on government work; what was left, went to the general public. In these cases, maximum prices having been fixed, the several parties proceeded to make their purchases independently. In other cases the government purchased once for all the entire

supply or output, and undertook for itself the work of distribution among would-be users. This, for example, was the procedure with wool. The Price-Fixing Committee established maximum prices for wool, and at these prices the government took over the entire domestic supply. Not only that; the government also bought a considerable quantity of imported wool, secured from the British government, as it happened, at lower prices than those at which the domestic material was bought. And having bought the entire output and having doled out among its clothing contractors what was needed by them (much the larger proportion of the supply), the government treated the remainder, and especially such grades as were not suitable for government needs, as available for civilian use. In this case, as in so many others, the preparations for a continuance of war upon an enormous scale were so far-reaching that the government found itself, on the unexpectedly early close of hostilities, in possession of a great supply of wool which it had no further occasion to use. There was here a difficult problem, not dissimilar to that of the guaranteed wheat price for the crops of 1918 and 1919. The losses on transactions of this kind will swell the war bills by hundreds of millions.

In the main, however, the Price-Fixing Committee rulings were applied under conditions less simple. In most cases, the government itself took a part only of the accruing supply; the Allies, and contractors and middlemen for the government and Allies took more; something was left for civilian use — a small fraction in some cases and a considerable one in others. Soaring prices, speculative advances, manipulations by middlemen, a runaway market — these were the conditions which impended, and which price-fixing was primarily designated to remedy.

The prices established were not in strictness fixed; they were maximum prices. The sole exception, as already indicated, was wheat; here there was a guaranteed minimum price. In every other case, whether as regards the Food Administration, the Fuel Administration, or the Price-Fixing Committee, the published prices were not to be exceeded, but need not necessarily be reached. In practical effect, nevertheless, the maximum prices as a rule were also minimum prices. This was the consequence of the conditions of demand out of which the business of regulation arose. The government departments — the War Department, the Navy Department, the Fleet Corporation and Shipping Board, the Railroad Administration — were usually guided in their purchases by the fixed maximum prices, and paid them once and for all. Allied purchases were in effect government purchases. Civilians as a rule gladly followed suit. Yet instances arose — with zinc for example, and lumber — where the market prices sank below those fixed; and thereupon the maximum prices were shortly reduced. These occasional saggings below the maximum prices naturally appeared first in non-government transactions. When they appeared, beginning sporadically and becoming gradually more pronounced, government departments also began to buy below the maximum figures; and then, with the expiration of the periods set by the price-fixings or agreements, new and lower figures were established. In every case, at all events, the form of the price-fixing arrangement was that of an agreed maximum price, not to be exceeded.

As time went on, a gradual transition took place toward greater elaboration and wider extension of the price-fixing arrangements. Several stages can be discerned. At first there were temporary, provisional arrangements. Blocks of commodities urgently needed

were turned over to the government on a patriotic, semi-sentimental basis. The sale of a great quantity of copper to the government in the early stage of the war was the most conspicuous instance. So with the sale of steel plates to the government. These earlier transactions were arranged by a committee of the Council of National Defense, before the establishment of the Price-Fixing Committee. They served their turn, yet soon proved impracticable as permanent arrangements. The patriotic producers sold to the government at low prices; their rivals, less public-spirited or simply less conspicuous, profited by selling at a higher price to the public or perhaps even to the government itself. Hence there soon developed a stage when prices were fixed not in single transactions, or for short periods, but for all government transactions and through a stated period. In this second stage, nevertheless, it was still the government price that was kept under control, not the price to the public. The inevitable result was again a discrepancy in the position of different producers or sellers. Those who sold to the government at the fixed prices were less fortunate than those who could sell (as usually was the case) to the public at higher prices. The process of fixing prices for the government but not for the public necessarily must have entailed sooner or later a rationing of the government orders, each producer to supply his proper quota to the government — a task obviously of great administrative difficulty. Hence, contemporaneously with the establishment of the Price-Fixing Committee itself, and for almost all transactions which came under the jurisdiction of that committee, the principle was followed of fixing a maximum price for all sales, whether to the government or to the public. President Wilson himself strongly urged such action, on the ground that it was not fair dealing on the government's

part to take advantage of the public. Rationing might indeed be entailed by this procedure also; but it would be rationing not between producers, but between purchasers. The stage of rationing, however, was never fully reached, and at all events, was never squarely faced. Substantially, the War Industries Board achieved something of the sort, by its regulation of industrial output and still more by its transportation priorities; but these apportionments were never directly connected with the activities of the Price-Fixing Committee. In the main the course of action by that Committee was comparatively simple: a maximum price, the same for public purchases and for private, the government taking all it wanted and the general public scrambling to buy at the maximum prices whatever it could get.

The basis upon which the findings and agreements of the Price-Fixing Committee rested was in the main the familiar and plausible one of cost of production. This, be it noted, had not been the case with the minimum price of wheat, settled as it was by Congressional action; nor had it been the case with the earlier sales of copper and steel to the government at prices below the market rates ruling during the early part of 1917. But as the price-fixing arrangements came to be systematized there developed also a systematized application of the cost principle to the price-fixing arrangements.

The figures and statistics of cost which were utilized were supplied in all cases by the Federal Trade Commission. On schedules sent out by it cost figures were furnished by the several producers, were checked and arranged by the Commission, and were presented to the Price-Fixing Committee as the basis upon which its findings and agreements should be reached. The labor

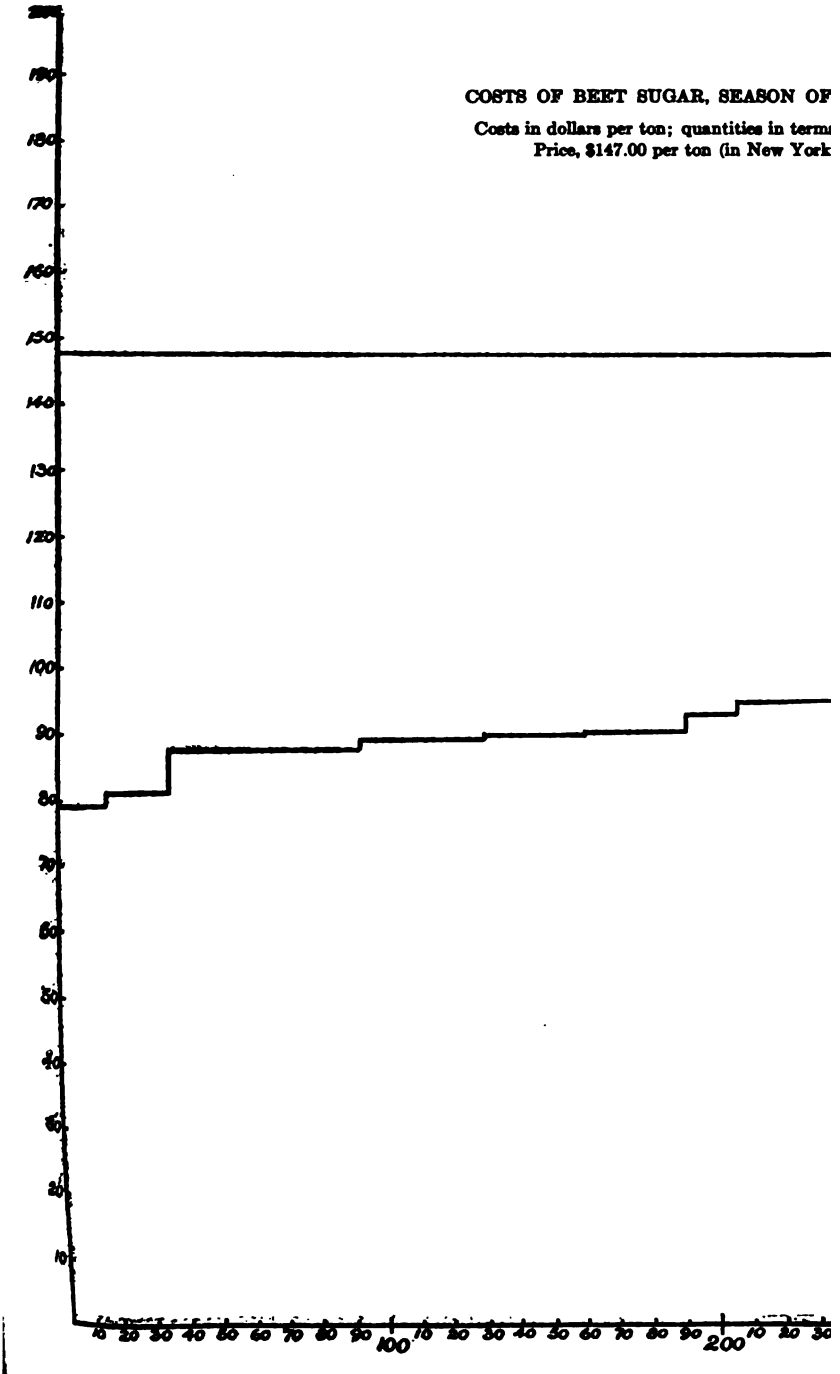
thrown on the staff of the Trade Commission by these operations was enormous. It deserves to be put upon the record that the results were achieved with a high degree of thoroness and success. Not that all desired or needed information was secured, or that the figures were in every case impeccable; but the accounting staff of the Commission was expanded with great rapidity, and was brought to a state of efficiency quite as high as could have been reasonably expected. Considering the suddenness of the exigency, and the extraordinary range and volume of the transactions that had to be followed, the achievement was a notable one.

As was to be expected, very varying conditions of cost and very varying relations between cost and price appeared in different industries. Sometimes there was but a single producer, in possession of a complete monopoly. Of this the most striking illustration was found in nickel, virtually all of which was produced by the American Nickel Company; and oddly enough this was one of the few cases in which, notwithstanding heavy increase in public demand and an eventual absorption for military use of virtually the entire supply, the price remained the same as that before the war, and was so maintained throughout. A similar case of monopoly was that of aluminum. Sometimes, and more complicated as regards the observable or desirable relation between cost and price, the conditions were those of joint cost — so-called by-products. The most conspicuous illustration was that of hides, whose price in turn necessarily dominated the price of leather. Another of the same kind was in sulphuric acid, which in some cases is a by-product from other operations, in other cases an independent or separable product. To apply any of the accepted economic formulae to the fixing of a price under conditions like these would have been well-nigh

hopeless. A frankly opportunist policy alone was possible.

The cases of most importance quantitatively, however, and those typical also of the general character of the price-fixing operations, were less complex, and gave or seemed to give better opportunity for some application of general principles and general reasoning. As a rule the products dealt with were turned out by many competing producers, and with costs that could be ascertained and segregated. Such, among the articles controlled by the Price-Fixing Committee, were lumber, copper, iron ore, iron and steel products; sugar for the Food Administration, and coal for the Fuel Administration. In all these the same phenomenon commanded attention, namely, that of marked differences in cost for different producers — a gradual shading from low cost producers at one extreme to high cost producers at the other. A cost curve or supply curve of the familiar sort was easily to be made out.

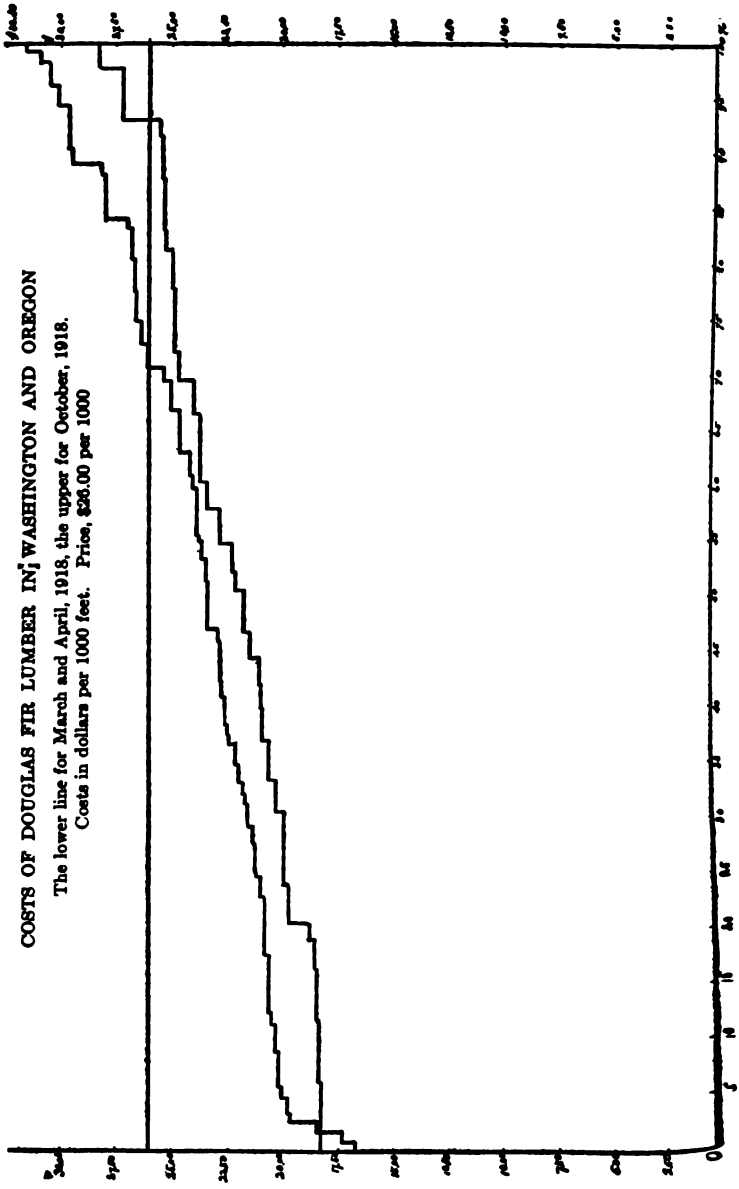
The appended charts are representative. They show quantities of output, and costs; the horizontal dimensions indicating the volume of product from each concern, the vertical dimensions the unit cost of the product. The coal chart is but one of a large number of the same kind prepared by the Fuel Administration. It is selected because it refers to the most important coal region of the country — that in southwestern Pennsylvania, where is the famous Connelsville field. The data for the coal charts were secured from the coal operators, as from other producers, by the Federal Trade Commission, and were then checked, corrected for bookkeeping errors, and charted, by the Fuel Administration. The collection of coal charts thus made constitutes an imposing mass of interesting material. The beet sugar chart is based on figures collected and

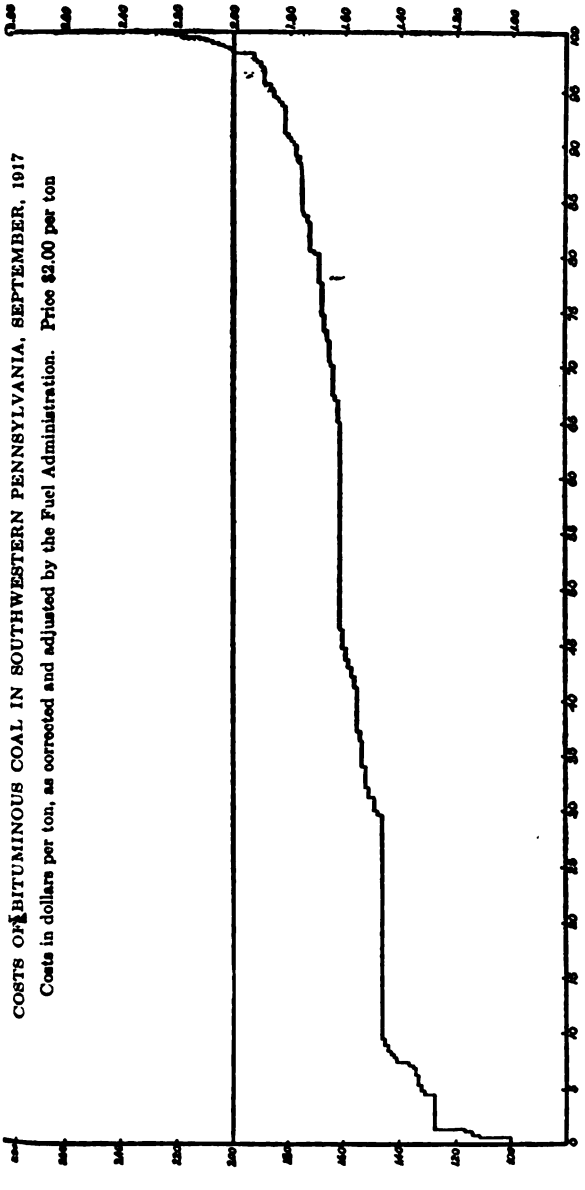

COSTS OF BEET SUGAR, SEASON OF
Costs in dollars per ton; quantities in terms
Price, $147.00 per ton (in New York
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
100
200

charted by the Tariff Commission and placed by that body at the disposal of the Food Administration. The lumber chart shows costs on the same plan, but for two dates, for the great fir lumber region of the Pacific Northwest. It is a combination of two charts furnished, at an interval of three months, by the lumber producers themselves.[1] The Federal Trade Commission did not usually put its data into graphic form; hence the utilization in this case of charts prepared for the Price-Fixing Committee by the producers. Probably the cost figures on which they rest would have been corrected in some details had they been submitted first to the supervising accountants of the Trade Commission. But there was abundant experience to show that corrections of this sort affected details only, and brought no serious changes either in averages or in the slope of the curves. Virtually these charts represent the data on which the Price-Fixing Committee based its action.

In general, in the price-fixing operations for such articles, regard was had to the marginal producers. A new jargon was often used, superseding that of the economists: the " bulk line " producer and " bulk line " cost were spoken of. It was cost of production at the hands of this marginal or bulk line person that usually formed the basis of the prices fixed. Sporadic cases of exceptionally and extremely high cost were disregarded, and properly so. Extreme high costs in individual cases are part of the flotsam and jetsam of economic life — accidents, of no real significance. The marginal or price-determining producer was found at the point where from 80 per cent to 90 per cent of the output was included. As a rule a price was fixed which would " protect " four-fifths or nine-tenths of the entire output.

[1] The significance of the two dates and the two cost curves given in this case is explained below, p. 229.


COSTS OF DOUGLAS FIR LUMBER IN WASHINGTON AND OREGON
The lower line for March and April, 1918, the upper for October, 1918.
Costs in dollars per 1000 feet. Price, $26.00 per 1000


COSTS OF BITUMINOUS COAL IN SOUTHWESTERN PENNSYLVANIA, SEPTEMBER, 1917
Costs in dollars per ton, as corrected and adjusted by the Fuel Administration. Price $2.00 per ton

A natural corollary of this method of procedure was, of course, the frank recognition of the fact that many low cost producers might reap large profits; and this in turn led to the expectation, even the assumption, that such producers would be subjected to a heavy excess profits tax. A considerable tax of this kind was already being collected in 1918, under the revenue act of 1917, on the incomes of 1917; an even higher one, applicable to the incomes of 1918, was in prospect. In this matter, as in so many others, the unexpectedly early cessation of hostilities caused a halt, and tax legislation was not enacted with the expected speed, perhaps will not be on the expected scale. At this writing (January, 1919) it is still uncertain what manner of excess profits tax will finally be levied. So far as price-fixing policy was concerned, a rigorous tax of this kind was regarded as a part of the general program.

This concentration of attention on the marginal producer has an appearance of obedience to economic theory. Cost at the hands of the marginal producer determines price; the infra-marginal man gets a producer's surplus; this producer's surplus is a fit object of taxation. The price fixed seems to be that which would obtain if economic principles were in normal operation. So delightful a verification of economic principles, so complete an empirical confirmation of their soundness, quite warms the economist's heart.

And yet, reflection leads one to pause. The case is not so simple, the confirmation of theory not so conclusive. In important particulars the situation is not the same as that contemplated when we discuss marginal cost in relation to price. The price fixed on the basis just described is by no means necessarily the same as that which would obtain if normal forces were working under normal conditions.

First, it deserves to be marked that the differences in cost here exemplified are by no means due solely, perhaps not predominantly, to natural or physical causes. In the familiar exposition of this sort of situation — the orthodox exposition — the differences in cost represent variations in the response of nature to man. The circumstance that they are merely employers' costs or expenses, not labor hours or labor sacrifice, does not in itself impugn their significance; since the money costs may be presumed to run parallel with "psychic" costs. More important is the complexity of the causes which are found to underlie the several figures. The figures which the charts illustrate are simply the actual money costs of the several concerns, as made out by accountants. The high cost in a given beet sugar factory may indeed have been due to the high price of beets, and that in turn to poor land or unsuitable climate. But it may have been due to bad farming, a bad season, bad factory management. The high cost of lumber may have been due to a thin and distant forest, or to an inadequate and ill-managed sawmill; the high cost of copper due to mining conditions inherently bad, or to a strike, a shut-down, or bad engineering in the mines. It is all one to the accountant, but by no means all one to the economist.

True, some of these differences may not unreasonably be supposed to offset each other. While a concern whose cost is high for a particular season may be in that unfortunate position because of accident or the vicissitudes of a particular season or ill-success in management, that same concern may advance in the following season to a moderate cost or low cost position. The reverse may happen: the low cost producer of this year may be the high cost producer of next year. And these shifts will tend to offset each other, leaving the scale or curve

for successive years very much the same. The marginal cost may not shift appreciably, even tho there be shifts of the producers who are incurring it. After all, in any set of concrete facts, anywhere and at any time, we cannot expect to find more than approximations to economic normality. And perhaps in this case the approximation, after all correction and qualification have been made, does serve to confirm general economic reasoning. It is probable that differences in natural resources are the most important among the causes determining the general slope of the supply curves here adduced.

But still another factor unmistakably shapes these curves. The differences in cost are found not only in the "extractive" operations, but in the purely manufacturing ones as well. This is perhaps most strikingly brought out in the case of sugar, where it happens to be possible to separate manufacturing costs from agricultural costs.[1] But, as soon as inquiry was made beneath the surface, the same variations were unmistakably to be found in other industries also. They are due mainly to differences in managing capacity. The familiar question of the "rent" of business ability once more obtrudes itself; the puzzling question of the significance of a marginal business man. Economists are doubtless in the right when they apply to differences in business ability reasoning analogous to that applied to varying fertility of soil. But here there is even more of approximation, of long run generalization, of uncertain conformity to any precisely-stated rule. The producer who appears to be marginal upon your chart, and who for a given season is fairly to be considered a "bulk line" person, may be after all one who is in process of

[1] See the able discussion of sugar costs by Mr. P. G. Wright, in this Journal for November, 1917.

elimination; who is holding on for the time being, but is bound to disappear in the long run and is not to be taken as a "fair" price-determining unit. There were abundant grounds for supposing this to be the case with the concerns that appear in the charts as the marginal producers of crude iron and of copper. So far from its being true that these producers, under ordinary market conditions, would determine the price, the reverse is more nearly true. It is the market price which determines which among them shall survive, not their cost that determines the market price.

At the risk of digression, a word may be added on the bearing of these distinctions on the applicability of a marginal cost principle. If the differences in cost which are indicated on these charts rest on physical causes — if they are due to forces in nature, not in man — the normal or long-period price may be expected to conform to marginal cost. But if they rest on the differing abilities of men, the normal price may be expected rather to conform to average cost, or at all events to fall below the "bulk line." In debates before the Price-Fixing Committee and in its own deliberations, the question was raised whether regard should be paid primarily to average cost or to marginal cost. Assuming that the object to be attained is conformity to fair price in the sense of long-period or "normal" price (an assumption of which more will be said presently) the answer would be, marginal cost if the differences in cost arise from causes in nature, but average cost (or something like it) if they arise from differences in managing ability. The marginal producer, if in that position because he is the least capable person, is not the one whose conditions of production are decisive. Such a producer as has just been intimated, is probably in process of disappearing. He will disappear very soon in times of depression, will drop

out gradually and haltingly in ordinary times, will hold his own with deceptive prosperity and success in periods of strong demand and unusual general profits. He is not a representative producer: not a person whose operations determine the long-period price range. Rather, he is one whose fate is determined *by* the price for the time being. Whether the long-period or normal price itself is an " average " — some sort of mean — of the varying costs of different managers, need not here be considered. I see no good theoretical reason to expect it to conform with exactness to any average; tho it might be a safe and easy working rule to consider average cost to be the same as long-run representative cost. But it would not be in accord either with current economic theory or with business experience to give to the least efficient manager (even if the extreme cases or " freaks " be disregarded) a dominant price-determining position. The representative firm (wherever in the scale it is to be found) is in that position.

The case would be different if the differences are the ineradicable results of soil, site, or abundance and quality of minerals; then one might be justified in proceeding on the ground that the normal price-determining cost was marginal cost at the hands of a manager of representative ability. In the cases represented on the charts (for lumber, sugar, and coal) the probabilities are that differences in nature's resources explain the upward trend of the cost curve; and hence that price in the long run would tend to conform to marginal cost, not average cost.

But, there remains the most serious qualification of all to this supposed verification of economic theory. The doctrine of price determination by the marginal producer is not to be considered as applying to anything but a long-run price. It has no bearing on the short-period

or seasonal price. Only over a period of years does marginal cost have a determining influence on price. The normal price which we speak of is one of the fictions or devices of the economist, like economic rent or an index number. It corresponds to no specific concrete fact which can be observed or identified; it is an artificially constructed type, a representative fiction. For the purposes of generalization a device of this kind is not only permissible, it is most useful. Yet it is not to be supposed identical with any specific fact. The price actually obtaining in any season for a given commodity may be higher or lower than the marginal cost figure reached on the " bulk line " basis.

This divergence of market price from any cost figure is obvious and familiar in the case of commodities subject to seasonal fluctuations, like wheat or sugar beets. It is no less unusual for commodities like lumber or copper. The price which is normal or " fair " for a given season or for a short period may be quite different from the marginal cost figure of that season. It was often said that the Price-Fixing Committee should pay regard to market rates, as settled by demand and supply; that it should have ferreted out the fair market price which would have obtained under the play of " economic laws." Now, quite irrespective of the impossibility of ascertaining a determinate market price under the conditions of war demand, it would still be true that any market price, even when resulting from an ordinary equilibrium of supply and demand, would probably not have been identical with the marginal cost price. For any given season and at any given time, your market equilibrium price may be much below or much above the marginal cost price. Price-fixing on the basis of marginal cost for the time being is by no means the same as price-fixing in accord with the ruling influences of the market at that date, or for that season.

No: the ground upon which this focusing of attention on the bulk line producer could be justified was an entirely different one. The guiding factor was the necessity of maintaining output. The commodities dealt with were, to repeat, such as were wanted in great quantity by the government. A large output was imperatively needed, or at least was supposed by the military authorities to be needed. This was the real justification for bolstering up the marginal concern and fixing a price at which the marginal concern could continue in business. This too was the ground for excluding from consideration the extraordinarily high costs of the producers at the extreme right of the curve; sporadic contributors who probably could not have operated with profit under any price conditions, and whose output would be no more and no less whether prices were fixed at a somewhat higher or somewhat lower figure. But the bulk line producers had to be maintained. Their output was needed, and the only way to secure it was to pay them a price which would induce the continuance of operations. It was this situation which caused the marginal producer to occupy such a dominant place in the price-fixing operations.

As time went on this dominance came to be less strong, or rather it came to be exercised under different conditions and with different results. In some industries the situation began to change. Even where the government remained the heaviest purchaser, it no longer required every ounce that could be produced. In many industries, indeed in most, a substantial quantity continued throughout to be allowed for civilian uses; as time went on it became a question how far these uses needed to be curtailed and how far the transfer of labor and capital to other more essential uses should be stimulated. As regards steel and copper, it is true, the

government absorbed to the very end almost the entire output; what remained for civilians was as essential as what was taken by the government itself. Fuel was no less urgently needed. Other articles, however, were not so vitally necessary. As the war went on, and its stern requirements became more and more apparent, every one perceived that if the industries indispensable for military and civil purposes were to have their full quotas of labor and capital, undiminished output was impossible in non-essential industries. Prices, like priorities and fuel, could not but be adjusted to a new basis.

This stage, in which price-fixing might be used as one among the measures for confining industry to military and essential needs, had been barely entered on when the cessation of hostilities put an end to the whole series of regulatory measures. Where it did begin, however, price-fixing took a new turn. The change of attitude took the form not so much of an enforced lowering of the existing maximum figures, as of a refusal to advance them. Lumber producers, for example, were able to show that their costs of production were rising. The two cost lines on the lumber chart (on p. 220) show how the cost curve for fir lumber of October, 1918, runs above that for the spring months; the marginal cost at the later date is higher by several dollars. Nevertheless the maximum price of lumber was not raised by the Committee; the previous basic rate, $26.00 per thousand, was left unchanged. The maintenance of the unchanged maximum, notwithstanding increased cost, was frankly announced to rest on the ground that the same output was no longer needed; civilian construction operations were to be cut down. The price, while left at the same figure, was in effect lowered, and a probable lessening of output squarely faced. The same policy —

that of maintaining maximum prices unchanged notwithstanding proved increase of cost — was followed for southern lumber, and on the same grounds. In both instances, it deserves to be recorded, the producers assented without demur. The unwelcome decision was accepted as an inevitable part of the war policy of cutting down non-essential production.

A case somewhat similar was that of cement. The government needed much cement for its construction operations, and indeed took the larger part of the output. But the output itself was lessened in consequence of the war. Building operations, except for government needs, were sharply curtailed; an effective means of enforcing curtailment in this case being the refusal of full coal supply by the Fuel Administration. Of the diminished output, the government in some localities took nearly one-half, but at a price below what would have been fixed on a basis of marginal cost for normal or pre-war conditions — a price barely sufficient to maintain production up to the government needs. Much the same course was followed when fixing a price for bricks in the regions lying about the large cities of the congested eastern district (New York, Philadelphia, Baltimore, Washington). Here too the government was a dominant purchaser, yet took less than the existing establishments could produce and paid a price below that to be expected under normal conditions of cost and demand.

Not all cases, however, of refusal to adjust prices to changing cost conditions, are explicable on grounds of this kind. A similar course of action was followed for iron and steel, but under different conditions and with different purposes and results. On steel, and more particularly the various forms of semi-manufactured steel, the prices originally fixed were left unchanged,

notwithstanding unmistakable advances in cost. The first schedule of prices for iron and steel had been made up before the Price-Fixing Committee itself began operations. Comparatively early in 1917, a committee of the Council of National Defense (which was to some extent a precursor of the Price-Fixing Committee) arranged with representatives of the industry for a sharp reduction of prices below those then ruling. In the making of the arrangement regard was indeed had to figures of cost which had been secured by the Federal Trade Commission, but no endeavor was made to base prices on any cost figures, either marginal or average. The cost figures of the Federal Trade Commission were used in effect as a means of persuading the producers to accede to marked reductions — indeed reductions so great as to effect a virtual revolution in the price conditions then obtaining. Notwithstanding these drastic cuts, profits for the great integrated concerns still remained high, even for those among them who might be regarded as marginal producers.

The prices then reached, by a sort of compromise arrangement, were left virtually unchanged during the price-fixing period. Costs, it is true, were advancing throughout that period, and the advances were gradually reducing the handsome profits which had been permitted. This might be interpreted as a lowering of the effective prices. And yet in this case unrelaxed maintenance of output, even an increase, was desired. The simple fact was that notwithstanding the paring of profits, inducements were still sufficient for a maximum output.

Here again an exception must be noted. What has just been said applies to the "hot metal" people — the great integrated concerns which use their own ore, their own coal, their own smelted iron, and which produce by far the largest part of the iron and steel. The

case was different with the non-integrated producers — the iron miners who sell their ore, and the "cold metal" people who produce pig iron and sell it for foundry and other uses. These were in a somewhat different position. The prices fixed for iron ore and pig iron were by no means so assuredly lucrative to the marginal producers, and in the course of the price-fixing readjustments some advances were made in the prices both of ore and of pig. They affected, however, a comparatively small portion of the product and were not important items in the general schedules of iron and steel prices. In the main, these prices, originally very liberal, were sustained without revision, with the consequence that the gradually rising costs resulted in a diminution of profits.

From time to time quite a different method of fixing prices was suggested as a means of securing undiminished output by producers whose costs varied widely. This other method contemplated something in the nature of pooling. Low cost and high cost producers alike were to receive prices in proportion to their several costs. The government was to charge itself with the average cost, and, so far as it allowed civilians to supply themselves, was to charge the civilians with that average. The process obviously would have necessitated the government's taking over the entire supply, and apportioning or rationing to civilians whatever was not needed for its own use.

This proposal rested mainly on an unwillingness to permit the low cost producers to secure high gains. Any price paid uniformly to all producers necessarily meant differences in profits. When that uniform price was fixed on the basis of the marginal or bulk line producer the profits of those favorably placed were not only great but greater than they would have been under norma

conditions. In the essential industries, such as steel and copper, the necessities of the situation called for the maintenance of high cost and inefficient producers whose position under no ordinary circumstances would be dominant. True, it was urged that the high gains for the fortunate producers were likely to be reached by the excess profits tax. But it was also urged that no such tax could be a complete offset, and that it would be wise to proceed at once upon a pooling basis: let the government's buying price be cost for each several producer, and average cost, not marginal cost, be the basis of any sales made to the public. The government as well as the public would secure the goods at lower prices.

This solution of the problem may be fairly said to have commended itself to no business man, and to few, if any, among the economists. Yet some of the objections raised against it were of doubtful validity. It was said to run counter to economic principle or economic law — to be inherently and necessarily bad. But this was hardly more than fencing with words. More serious was the argument that it would penalize efficiency, removing all incentives to keeping costs down. The objection would have been serious, perhaps conclusive, against the long continued maintenance of any such arrangement. For a short time, however — say for a period of a year or thereabouts, and this was generally expected in the summer of 1918 to be the duration of the war — little evil on this score was to be anticipated. For the time being industry was likely to go on as before, the efficiency of the different producers remaining very much the same by sheer force of impetus, if not from motives of patriotism.

The conclusive objections to a pooling system related to the accounting and administrative problems involved. The plan would have necessitated accurate ascertain-

ment of cost for each producer. There is an obvious difference between the amount and character of the accounting data needed for this purpose and those needed on a bulk line or marginal cost basis. For the latter purpose it is necessary to ascertain only an approximate marginal cost figure, and to settle the price in accord with this, irrespective of its accuracy for any individual producer. It is quite unnecessary to check the accounts for the great range of producers whose costs fall below the marginal line. The low cost men may be known to be in a favorable position; but just how low their costs are, or just how high their profits, is not material. But on the pooling plan precise information on costs must be procured for each and every producer. Virtually every one then operates upon a cost plus profits plan. Verification and adjustment of accounts, decisions on inventories and depreciation, distinctions between capital and income account, auditing, suspected and actual manipulation, squabbling, charges and counter-charges — these are the inevitable accompaniments of any such procedure. The cost plus profits contracts of the earlier stage of the war illustrate them sufficiently. The difficulties into which the Food Administration was led in its application of a cost plus profits system to the regulation of flour mills during the season of 1917–18 supply another illustration.[1] This mode of dealing with a vast number of establishments, over a great range of industries, threatened such ominous complications that any administrative or regulative body could not but shrink from it.

It is this last consideration which explains why the suggestion was pressed in two cases only: both of them cases in which the number of individual producers was small, and in which the problems of cost accounting and

[1] See the article by W. Eldred, in this Journal for November, 1918, p. 1.

cost analysis were simple, or at least seemed to be simple. These two cases were anthracite coal on the one hand, and steel rails on the other. Anthracite coal was in the jurisdiction of the Fuel Administration; steel rails in that of the Price-Fixing Committee. Virtually nothing ever came of the suggestion in either direction. Altho the Administration and the President were reluctant to sanction an increase in the maximum prices of anthracite coal, such as advancing costs justified, and urged an attentive consideration of the possibility of keeping the price down by some method of averaging or pooling, marginal cost was accepted as the determining factor even in this case.

The plan was most urgently pressed for steel rails. Here the number of individual producing concerns was small; costs varied greatly, and at the same time could be ascertained with an unusual degree of accuracy. Moreover, all the standard rails were bought by the government, the civilian consumption being restricted to rails of special sizes — an extremely small percentage. The government demand came chiefly through the War Department and was for rails to be used for the transportation needs of the army in France. The Railroad Administration, as it happened, was not for the moment directly concerned, being in the fortunate position of inheriting contracts made in earlier times by the railroad companies at prices below those which would have resulted from any figures either of marginal cost or average cost. Yet the Railroad Administration urged the application of a pooling plan to steel rails. Notwithstanding the conditions which thus favored the plan in this case, or at least made it more feasible, the final decision was the other way. The price of steel rails was fixed on a basis roughly of marginal cost, and the same uniform rate was paid to all producers.

In the iron and steel trade at large some slight movement toward pooling was made. It took place, however, not through any direct government action, but by an undertaking on the part of the integrated producers that they would have regard for some of the more refined branches of the iron and steel trade which bought and used the crude material cold, and would rescue these from the necessity of paying the full marginal cost price for their raw material in every case and of then charging it against the government in the price of their own finished product. The tentative and informal arrangements made with this object in view, however, could hardly be said to constitute a pooling arrangement; they were but an acknowledgment of the desirability of maintaining full output without the payment in all cases of the very utmost marginal cost.

Quite a different question of general principle was raised before the Price-Fixing Committee by the contention that in fixing the maximum price for any one commodity regard should be paid to the general price level and the general advance of prices. In effect the proposal was that there should be some equalization of inflation. Many prices had gone up 50 per cent or 100 per cent; why should not our article go up as much? Lumber had advanced less than iron and steel, sugar less than wheat and corn. Elaborate figures were presented to show that a thousand feet of lumber could in 1918 buy less of steel, wheat, copper, wool, than the same lumber could have bought in 1914. Was there not an obvious injustice to the lumber producers?

The argument was never pressed so far, or with such insistence on the equity of treating all quite alike, as to urge that every seller should get as much as any other — a percentage increase as high as the highest anywhere. So pressed, it would have been easily met by a

reductio ad absurdum. But it was argued that fair treatment would be secured only if some sort of regard were paid to the general price level — if no one commodity were permitted to lag very much behind the general run.

No set answer was ever given to this contention. Indeed, in the official rulings and pronouncements, general reasoning of any sort was little in evidence. But the argument was given little countenance, and by implication was set aside. Each industry was treated by itself, quite in opportunist fashion. Specific evidence on advances in materials and wages and on ascertainable or presumable profits was taken into consideration; but what might be happening in other industries was regarded as quite an independent story.

This negative or non-committal attitude was not only cautious and therein shrewd, but doubtless was intrinsically sound. The assumption that all prices should or might reasonably rise as much as the general level would have been equivalent to assuming that under normal conditions, in the absence of inflation, all prices would also conform to a general mean or average. In fact they show infinite variety of rise and fall. There would be no conformity to normal relations if these familiar diversities were smoothed out in a period of inflation. It was wise to consider each industry and each commodity by itself. As the general upward movement reached the materials and the labor of the particular industry, the rise was reflected in the cost figures submitted, and was duly considered in settling the maximum price. If not so reflected, let that price lag behind the general advance. In times of general price stability, under similar conditions of production and demand, the price of such a commodity would presumably have fallen.

There was indeed a conceivable case in which a different treatment might have been fairly asked: namely

one in which the materials and labor for the given industry were in a tight compartment, not affected by outside conditions and not responsive to the pervading influences except as they affected the final products of that industry. Then indeed the cost items for the particular industry could advance only if the product itself should previously advance. A sort of impasse would have resulted — " costs " could not be advanced until price of materials and labor rose, and yet these costs could not rise if government regulation interposed a veto on an advance in the article produced. But no such case was presented for settlement, not even one approximating these exceptional conditions. In fact, it was alleged throughout that the advances in wages and in materials, so far from being confined to one industry or one locality, were general and pervasive. They were forced on the producers by competition from without. In other words, the forces leading to inflation were at work on all sides, and showed their effects everywhere in rising wages and in rising prices of purchased materials. Hence the general advance was necessarily considered, so far as it needed to be or ought to have been, when due consideration was given to cost and profit figures.

As appears from this survey, government price-fixing during the war was not uniform in its objects, and was little guided by principles or deliberate policies. In the main it was opportunist, feeling its way from case to case. The Food Administration had indeed clearly defined objects, yet hardly a clear formulation of the principles to be followed in striving to attain them. The Fuel Administration, dealing as it did with a single commodity of well marked type, was able to proceed with most system and method. The use by it of the

marginal or bulk line principle was deliberate and consistent. The Price-Fixing Committee, whose wide range of operations might make its doings of most general interest to economists, was slowest in developing a general policy; and this probably for the very reason that its scope was wide, its principles of action little prescribed by any legislative or administrative instructions. What has been said in the preceding pages about the application of the marginal principle by the Price-Fixing Committee probably states its policy with greater sharpness of definition than is warranted by the actual decisions or formulations. There was no more than a gradual and tentative approach to any principle of action whatever. This restraint was as wise as that of a court of law which refuses to commit itself on any questions of principle not essential to the case in hand. Had the war continued, and had the regulation of industry lasted longer and extended farther, all sorts of new situations and new problems would have arisen, for whose wise disposal no rule could be laid down in advance.

Regulation came to an end almost immediately after the conclusion of the armistice. The War Industries Board in general terminated its restrictions and prescriptions as promptly as possible, and the Price-Fixing Committee did the same. No new price agreements were made after the armistice, and those in effect were allowed to lapse as they expired. In almost all cases, prices had been fixed for periods of three months; and as each such period came to its close, no further action was taken, and thereafter the free play of market dealings again set in. Most of the agreements terminated late in December, 1918, or on January 1, 1919; a few held over for a month or two into 1919.

Whether price-fixing would have completely broken down under greater tasks and greater strain, it would be rash to say. Perhaps forces would have been encountered, of the kind termed "economic," or perhaps of a kind not included in the usual economic list, such as to defy attempts at regulation and to confirm the predictions of those who believed that all regulation must come to naught. The experiment, if such it can be called, was not carried through to the end, or with system or consistency; and the lessons it yields are accordingly far from conclusive as regards fundamentals, and are qualified even within the limited range to which they apply.

So far as the experiment went, and so long as it lasted, the outcome seems to me to have been good. The rise of prices to be expected from inflation of the circulating medium was not prevented; but then no endeavor was made to achieve this sweeping object. There is nothing in all the price experiences to prove or disprove the contention that, irrespective of legislative or administrative fiat, general economic forces must work out their general effects. But that the impinging of the forces was in some degree affected and curbed seems undeniable. Food and fuel prices were prevented from fluctuating as widely and soaring as high as they would have done in the absence of regulation. A result of the same kind, and apparently not less in extent, was secured for other price-regulated articles. The traditional statement of economic formulae gives them an appearance of greater rigidity and sharpness than is warranted by the premises on which they rest. Supply and demand, monetary principles and monetary laws, are customarily formulated in exact terms, with an appearance of mathematical sharpness. The qualifications which must attach to these "laws" in any concrete application or

:ation, familiar to the well-trained economist, leave lant room for some exercise of restraining and rated action. No doubt there are limits to which ıction must be confined; but they are not narrow , and within them much was done which proved of .tage to the country.

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THE BURDEN OF WAR AND FUTURE GENERATIONS

SUMMARY

Burdens of war are objective and subjective, 242. — Costs resulting from destruction, and cost of maintaining the fighting forces, 243. — Choice between rival ways of financing a war, 245. — Different effects of the levy plan and the loan plan, 247. — The assumed burden of a loan to the lender, 249. — Subjective burdens of levy and loan methods, 252. — Conclusion, 254.

I HAVE been invited to contribute to the *Quarterly Journal of Economics* an article on how far and in what sense the burden of the war can be shifted on to future generations. This question is one of practical as well as theoretical importance and I welcome the opportunity of examining it. Some of the issues involved are, indeed, obvious, but others have been the subject of controversy. A part of the difficulty has arisen out of an ambiguity in the meaning of the term "burden": for that term may be interpreted either *objectively* as a cost in things and services, or *subjectively* as a cost in satisfactions. In the following pages I shall endeavor, keeping this distinction in mind, to set out the whole problem in a logical order.

The objective burden which future generations bear as the result of a war is measured by the difference between their actual economic situation and the situation which they would have enjoyed if all other things had been equal and no war had occurred. This difference in economic situation, interpreted in the broadest sense, will, for any country, take account of the indirect effect of war casualties upon the quantity and quality of the population of which future generations are composed.

For the present purpose, however, a somewhat narrower interpretation is more convenient, and I propose, leaving the difference made in the people themselves out of account, to consider only the difference made to their economic environment.

The real costs of war to a country include two parts, the destruction wrought in it or in its possessions by the enemy and the resources devoted by the country itself to the conduct of the war. The former of these groups includes in an invaded country all the wreckage done to houses and furniture and roads and land; in an uninvaded country the results of bombardment from sea and air and the destruction and damage done to shipping. The latter group includes the whole body of effort wrought by men laboring in conjunction with equipment to supply the sinews of war, together with the existing capital stock actually used up in the war, e.g., trees cut down, railway lines torn up, rolling stock sent to the front and destroyed there and so forth. In a country which is in contact and communication with the rest of the world yet other elements will be involved. For the government of that nation may, for the purposes of the war, borrow either from the governments of other nations or from individual foreigners, and, even when the government does not so borrow, private persons in the warring countries, in order to provide their contributions, whether of loans or taxes, to the government may do this; or, if they do not actually borrow from foreigners, they may do what is substantially the same thing by selling foreign securities or other marketable possessions formerly held by them to foreigners and using the proceeds for the war. Finally, the government or private persons may ship abroad gold for the purchase of war material thus depleting the gold reserves of the country.

These various costs are in part, but only in part, represented in a deterioration below the standard which it would otherwise have attained in the economic environment of the future: because, to meet them resources are obtained, not only by drawing upon that environment, but also in other ways. When so many factories and houses have been destroyed by enemy action, so much of a country's forests cut down, so much labor and capital diverted from making and maintaining industrial equipment, so much foreign borrowing undertaken, this inventory of cost is not equivalent to an inventory of objective burden thrown upon the future. Broadly speaking we may say that, in so far as the costs of war are met in ways other than the provision of extra work by the war-waging generation and the undertaking by them of unusual economies in personal consumption, these costs are thrown upon the future — it being understood that, against these costs the future is likely to have left to it certain durable forms of industrial equipment which were made for war purposes but remain and are useful also in peace. We cannot, however, make the converse statement that, in so far as war costs are met by extra work or unusual personal economies they are not thrown upon the future, because this extra work and reduced consumption is likely, by wearing out the efficiency of the present generation to reduce the contribution which it is able to make to production, and therefore, *inter alia*, to the capital equipment available for future generations. How far this sort of reaction will go must vary, of course, with different classes of people: — extra work for those who normally work hard and diminished consumption for those who already live sparingly will have a much larger effect than extra work for normal idlers and reduced consumption for gourmands and pleasure-seekers. The general conclusion

must be that costs met in these ways (and of course this holds good whether they are so met during the actual course of the war or during the period of reconstruction immediately following it) are partly thrown by an indirect process on the future. On the whole, however, they are likely to be so thrown in a much less degree than costs which are met in the other ways described in preceding paragraphs. Hence the greater the extent to which war costs are met by extra work and personal economies the smaller the extent to which future generations are likely to be burdened by them.

The choice between rival ways of meeting war costs, and therefore the extent of the objective burden on future generations, is influenced by a number of important factors wholly independent of the financial policy pursued by the government. Among these are the strategic position of the country and, therefore, the physical power of its citizens to borrow from abroad, the extent to which its citizens hold securities saleable in a foreign market, the extent to which there is labor power in the country which normally is leisured or not fully occupied, and the willingness of the people to stint their personal comfort and enjoyment for a public end. These factors call for no special comment. Let us suppose that in respect of all of them the conditions are given. On that assumption a very important question has to be faced, namely, what difference will be made to the sources from which war costs are met, and therefore to the objective burden thrown on future generations by the policy which the government chooses to pursue. The foreign borrowing undertaken by it we may suppose to be determined by military considerations — foreign loans constituting a kind of extra over and above what it can get out of its own people — which lie outside our purview; and attention may, therefore, be con-

fined to the choice between various sorts of domestic taxes and domestic loans.

There is a distinction of some importance between the *nominal subject* and the *real subject* of a levy, whether the levy be by way of taxation or of loan. The nominal subject is, of course, the man from whom the money is actually taken over by the state. In so far as this man cuts down charities or presents or wages (while retaining the same staff) to provide this money, he is not, however, the real subject. For he simply transfers the obligation of meeting the call involved in the levy on to somebody else. This somebody else is the real subject of the levy: the nominal subject is the real subject only when he furnishes the funds required otherwise than by transferring the obligation away from himself. It is thus plain that it is the conduct of the real and not of the nominal subject that is of interest from the present point of view. Every one knows that the levy of £100 will have different direct effects when it is made from different real subjects. Taken from one, it will cause him to work harder; from another it will check personal consumption; from another it will check investment; from another it will cause him to let his plant run down a little; and so on. Now different methods of war finance involve different distributions of war charges, and it would, therefore, seem that we should be able, by analyzing their distributions, to trace out their respective consequences upon the position of future generations. The beginning of this investigation looks prosperous enough. Thus we know that the poor can at the best of times save very little; and they have no plant to keep up. Consequently war levies exacted from them practically must be provided out of extra work and extra personal economies. Unfortunately, however, it is just among the poor that resort to these methods is specially

likely to react on efficiency and so injure productive power. This reaction *may* in the end hit future generations, by indirectly lowering productive equipment, as much as an equivalent levy on better-off persons, part of whose contributions would come out of funds destined to be turned into material capital, would do. There is no getting over this difficulty. In consequence of it, we cannot, I think, lay down any broad distinction between different methods of war finance which will enable us to say that one method is likely, on account of its distributional reactions to involve more or less objective burden to future generations than another method.

We must not, however, stop at this negative conclusion. Various methods of war finance do not differ solely on the side of distribution. We have still to contrast the consequences of taking £1,000 from a man by way of loan and taking exactly the same sum from the same man in the form of a tax levy. If this man were a representative man and there was no such thing as economic friction, the choice between the two plans would be indifferent to him. If the money is taken in a levy the man loses it outright; if it is taken as a loan he is promised £50 a year on it, but knows that he will have to provide the £50 himself in extra future taxes. True, it may be said, if he is confronted by an emergency, and has a £1,000 war bond, he will be able to sell it and turn it into ready money at the cost of being £50 a year poorer afterwards. But, in the absence of economic friction, he would, in a like emergency, if he did not possess the war bond, be able to borrow £1,000, also at the cost of being £50 a year poorer afterwards. This argument is valid in the abstract. But, of course, in actual life economic friction is a real thing and a man cannot borrow £1,000, unless he happens to have good

collateral, with anything like the ease that he can sell a £1,000 war bond. Therefore, as a matter of fact, if there is a chance of emergency, it is a real advantage to have a £1,000 war bond even tho the whole of the interest one gets on it is paid by oneself. Moreover, besides this real advantage of loans over taxes to the persons who furnish the money there is also an imaginary advantage: for it will not generally occur to those persons, even tho it were exactly and demonstrably true, that they will themselves have to pay individually the interest they individually receive. Consequently, they will certainly *feel* better off under the loan plan than under the tax plan, and are, therefore, likely to provide what they do provide more largely by cutting down investment and less largely by extra work and economies in personal consumption than they would have done under that plan. To this extent, therefore, the loan plan, in so far as the money is raised from the better-to-do classes, will react on the sources from which war costs come in a way that involves a larger objective burden on future generations than would be imposed upon them under the tax plan.

And there is yet a further point. The argument of the preceding paragraph proceeded on the assumption that the people who provide money under war loans are so situated that, after the war their taxes (so far as required to finance war debt) and their loan interest are expected to be equal. As a matter of fact, however, experience has never yet revealed a tax system anything like as strongly graduated for increasing incomes as loan subscriptions are normally found to be, at all events when the loan required is large. Hence, the richer classes, from whom, when a large amount of money is wanted, contributions under any plan *must* chiefly come, will think, and rightly think, that a loan hits them much less

severely than an equivalent levy would do. Hence the inducement to work harder and to effect personal economies in consumption will be correspondingly less, and they will be more inclined to rely in one way or another upon draughts on real capital. It is true that the poorer classes, with the prospect of heavy taxation before them will, if they understand the situation, realize that under the loan plan they will be hit more severely than under the levy plan; and that, therefore, they should tend to work harder and economize more. It is plain, however, that in practice this tendency will work very much less strongly than the converse tendency among the rich, while, even in so far as it does work, its consequences are ambiguous because of the damage likely to be done to the productive efficiency of those affected. On the whole there can be no doubt that under the loan plan capital resources will be more seriously depleted, and future generations, therefore, more seriously burdened than under the levy plan.

I now pass to a further problem. Let us suppose that full account has been taken of the difference between the effects of the levy plan and the loan plan upon the conduct of the persons affected during the war, and of the way in which this difference is reflected in the direct objective burden borne by future generations. Does the choice between the two plans involve any further difference over and above this in the amount of that direct objective burden ? In answering this question it is well to distinguish between the payment of interest on the war debt and the repayment of principal through a sinking fund. So far as interest is concerned, it is obvious that what is taken from the income of tax-payers in taxes goes into the income of holders of war loan, and that, therefore, all that happens is a transfer of income from one section of the community to another section,

and, in so far as tax-payers and war loan holders are identical, from one pocket to another pocket in the same coat. Plainly in a transfer of this kind it is impossible that any *direct objective burden* — I am not at present concerned with other sorts of burden — can be involved. There remains the money raised for repayment of principal through a sinking fund. As regards this it has been claimed by certain writers that the preceding argument is inapplicable. They reason that, when a holder of war loan has the principal of his loan paid off by the government, he receives no benefit, but is simply left in his old position — possibly a slightly worse position, because he will have the trouble of finding a new investment — and that, therefore, there is nothing to set against the objective burden thrown on the tax-payer in the form of taxation to provide the money to pay him. Professor Seligman writes: "The fallacy involved in the contention that the sacrifice imposed upon the future tax-payer is counter-balanced by the benefit accruing to the bondholder consists in the failure to realize that there are no benefits thus accruing to the bondholder." [1] Professor Scott arrives by similar reasoning at the same conclusion: "Speaking quite generally, the effect of a loan (he is discussing an internal loan) is that posterity is rendered liable to do the amount of work which is necessary to pay it off." [2] The substance of this argument is that, since, in the main, repayments of principal made to holders of war loan are certain to be reinvested, posterity as a whole will be forced by the process of debt repayment to create new capital, and so to refrain from consumption, to approximately the extent of the debt repayments. Let us provisionally accept this presentation of the facts. Even so to suggest, as the language

[1] Annals of the American Academy, January, 1918, p. 64.
[2] Economic Journal, September, 1918, p. 258.

used by Professors Seligman and Scott seems to do, that they imply a *direct objective burden* on posterity equal to the amount of the debt repayment is paradoxical in the extreme. Posterity will possess the new capital which it has been induced by the fiscal expedients of the state to create. What right have we to ignore this possession ? To do so is as tho one should say that a man who has been induced by circumstances to put £100,000 into a factory instead of into a yacht or a bean feast was thereby made poorer to the extent of £100,000 than he would otherwise have been. If there were reason to suppose that the world would end immediately after the investment had been made, there would indeed be something to be said for this view. But at present no cosmical catastrophe is in sight and posterity may be expected to reap the fruit of its investments in the same way as its ancestors. Thus, tho it is true, as Professor Seligman asserts, that the bondholder gets no benefit from debt repayment, it is also true that the tax-payer suffers no loss. What he in effect does is to make an investment of certain funds, the proceeds of which will serve in future years to keep the bondholders' position intact without any further call upon the tax-payer himself being required. On posterity as a whole no *direct objective burden* is imposed by debt repayment of an internal loan, any more than by payment of interest upon it.

We may conclude therefore that, apart from the consequences produced through reaction on the conduct of the persons affected at the time, the choice between the levy and the loan method makes no difference to the direct objective burden thrown on future generations. The payment of interest and the repayment of principal alike are transfers, not costs, and to whatever there is somewhere lost there corresponds elsewhere an exactly equivalent objective gain. It does not, however, follow

from this that no difference is made by the choice between the two methods in the *subjective burden* borne by future generations. There is reason to believe that it is of this rather than of the *objective burden* that both Professor Seligman and Professor Scott are really thinking — tho to interpret them so involves a rather generous straining of their language — when they claim that the need to repay internal war debt throws a real burden upon posterity. Let us, therefore, consider the effects upon subjective burden. To simplify the discussion I shall begin by studying a representative man so situated that what he pays in taxes to finance the debt exactly corresponds to what he receives in interest and in repayment of the principal of his war loan holdings. In these circumstances it is obvious that the interest money merely comes out of one pocket and goes into another, and that a subjective burden is excluded as completely as an objective one. But with the part of the tax used to repay principal the position is a little different. In effect £100 has been taken from our representative man in taxes and then paid back to him as a price for cancelling his £100 war bond. If this procedure had not been gone through, this £100 would have remained in his disposable income and would, we may suppose, have been spent. As the procedure has been gone through, he realizes that, should he spend it, his "capital" will be £100 less than before and his future income therefore £5 less. He will, therefore, it would seem, need to save the greater part of that £100 and invest it so as to keep up his capital and conserve his future income; and this new need will obviously involve a real subjective burden. Such reasoning, however, ignores the fact that, tho if he does not save that £100, his future income will be £5 less, his future taxes, out of which his war loan interest is paid, will also be £5 less, since the £100

of war loan to provide interest on which the taxation is required has *ex hypothesi* been cancelled. When account is taken of this fact, it becomes apparent that the representative man's *net* income, after taxation has been deducted, will be exactly the same in the future as it has been in the past. His position as a whole, therefore, is not damaged in any way, and there is no reason why, to safeguard himself, he should save that £100 which he would normally have spent. It may perhaps be replied that the prospective escape from taxation will not balance the prospective loss of interest because he may reckon that, as general wealth increases, the amount of taxation which he personally will have to contribute will fall. But this reply is illicit, because he must be taken as a representative man whose wealth and (in his family) numbers expand in the same ratio as that of the whole community. A second possible reply — that the tax will fall through loan conversion — is obviously irrelevant since conversion would reduce loan interest equally with the taxation made to provide that interest. We may conclude, therefore, that, if he realizes the whole situation, the representative man will suffer no subjective burden in consequence of debt repayment. No doubt it is probable that in practice he will not realize the whole situation and will not perceive that his loss of capital is balanced by his saving of prospective taxation. So far as he fails to perceive this, he *will* be pushed into saving part of the £100 which he would normally have spent, and so *will* suffer a subjective burden. This appears to be the leaven of truth in Professor Seligman and Professor Scott's reasoning.

Naturally this is not a complete account of the position. For, in actual life, as I have urged strongly elsewhere,[1] when money is raised for a war, such a vast

[1] The Economy and Finance of the War, pp. 66 et seq.

amount is required that a very much larger proportion has to be taken from the rich — who have a wider margin — as compared with the poor that it is usual to take from them under normal taxes. When loans are employed, therefore, it is almost certain to happen in practice that the money raised afterwards to pay interest and repay principal upon them will be taken from the poor in much larger quantities than it is received by them. The annual transfer of resources to serve the war debt is thus in considerable measure a transfer from poorer persons to richer persons. Obviously that fact involves a large subjective burden to posterity as a whole; for the simple reason that a poor man is injured much more when a shilling is taken from him than a rich man is benefited when a shilling is given to him. This is, perhaps the chief practical objection to financing wars by internal loans to any greater extent than is absolutely necessary. But this element of subjective burden on future generations, tho it is almost certain to be associated in fact with the loan method, arises out of the way in which, as a matter of fact, governments choose to distribute normal taxes, and is not inherent in the method itself. In a purely abstract comparison between that method and the levy method, it should, therefore, be left out of account.

So far I have considered only the direct objective burden, and the subjective burden arising out of this, which is borne by future generations. It has to be added in conclusion that the loan method also strikes at the future in an indirect way. It does this because it involves in the future large and continuous taxation to provide funds for the service of the debt. The fact that taxes raised for this purpose represent merely a transfer and not a using-up of resources, does not warrant the inference that they are innocuous to production. On

the contrary, it is impossible to raise large sums of money by taxes which have to be continued year after year, and the impact of which, therefore, everybody anticipates and prepares for, without in one way or another hampering production, discouraging industry and driving capital and ability to seek investment elsewhere. The extent to which these things happen depends, of course, partly on the scale of taxation that is necessary, partly on the kind of taxes which the government chooses to impose, and partly on the comparative position of the particular country under review and other countries in the matter of tax rates. But to some extent they are practically certain to happen. In this way future generations will be hit by the aftermath of a policy of finance by loans. Nor can it be justly replied that a policy of finance by levies will hit them to an equal extent because it will discourage industry and drive capital away during the war itself, thus injuring the equipment which is left to the country after it. For, during a war, not only are special motives of patriotism at work to maintain industry and government restrictions to prevent the export of capital and brains; but also, wars being short, taxes levied in war time are not expected to continue as ordinary taxes are and are not capable, therefore, of reacting so strongly upon production. In any complete comparison of the effect upon future generations of financing war by levies or by loans a very important place must be assigned to this last element in the account.

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WAGE THEORY AND THEORIES

SUMMARY

Labor-purchase theory of wages, 256. — A Crusoe or collective analysis, 257; inapplicable for competitive purposes, 258; but invoking the selective working of the iron law, 261. — Property as affecting iron law, 262. — Predation and survival, 263. — Minima of living and death rate, standard of living and birth rate, as bearing on wages, 264. — Both the minimum and the standard doctrine are cost doctrines for the supply of men who have no costs of production, 265. — Bearing of numbers on per capita product, 268. — Flexibility of standards of living, 270. — Population limited by increasing product, 271. — The causal nexus, 272. — Wage-fund theory, 274. — Labor-pain theory, 278. — Productivity theories, 280; in ethical implications, 280; in distributive precision, 282. — Surplus-value theory, 286. — Reconstruction, 288. — Production in competitive meaning, 288. — No outlook for higher wages at expense of employers, 288. — Possible lines of amelioration, 289. — Institutional conditions and competitive processes as affecting (1) the distribuend, (2) the distribution rations, 291. — Conclusion, 297.

THE environment of the group is its habitat; of each individual, the habitat plus the other members of the group. For group purposes, therefore, human labor applies itself mainly to effecting desirable changes in the habitat and desirable responses from it. From the point of view of the individual the desirable results, the economic returns which he achieves, may accrue either from the habitat or from the other individuals — desirable results for him, irrespective of whether they are beneficial or desirable either for the habitat or for other individuals. In strict analysis also, it is possible from the point of view of the group to regard as economic production such results of human effort as achieve desirable modifications in the group or in members of the group, and to regard as productive from the individual

point of view such modifications of other individuals in the group as are desirable for the particular individual concerned.

Looked at in the large, therefore, and seen from the group point of view, it is not irrational to regard as a wage whatever returns nature awards to human effort. This view conceives of production as a sort of exchange process, almost a contractual relation, in which man as laborer serves the environment as employer — effort applied for product promised, labor performed against products returned. "Labor was the first price, the original purchase money that was paid for all things" in the barter between man and nature, a relation of quid-pro-quo, in which relation, however, the advantages accruing to the employer are not quite so obvious as those obtained by the employee.

For the isolated economy, at any rate, the essential relations in the case need not be misreported through this implicit personification of the environment. How the trade shall go off, and with what advantages to Crusoe as laborer, must, as obviously as rationally, be affected not merely by the vigor and seriousness of Crusoe's effort but also by the intelligence and skill by which Crusoe — not Crusoe's employer — is able to direct the effort. On the other hand, the quality of the environment will have much to say for the response that it makes — the benefits that are in prospect from it, the wages that it can furnish and pay. The greater the results achieved by Crusoe the higher obviously are the wages that the environment returns, it being taken to promise always the maximum wage possible of payment by it, in view of the results achieved within it and for it — the more for the laborer as he produces more, a perfect working out of the specifications of the productivity theory of distribution — if only, mark, it

could be safely assumed that the environment itself is always void of productive efficiency in its own behalf, and if therewith there could be any coöperating productive factors achieving together a joint product — and thus any distributive problem at all.

Nor is there any valid objection to this same manner of thinking as extended to cover any group economy taken as collectively organized. And thus it has happened that out of the biological fact that no more individuals of any species can live within any given habitat than the habitat can supply with nutriment, a law of wages has been deduced. In truth, the iron law of wages necessarily emerges so soon as it is assumed that there is no limit upon the reproduction of human beings other than the food limit or, it may be, than the raw material limit. But even so, the group supply of food, however scant, need not accrue through any sort of wage relation, or by virtue of any effort or sacrifice put forth or of any return received thereon. If only all competitive implications are rigorously excluded the product may be sheer gratuity. The traditional rats in the barn, considered as a group, need no more dig or delve than spin or weave. The group income is pure environmental bounty as distinguished from wages. But none the less this food limit remains the multiplication limit — the death rate finally equating against the birth rate in such fashion as to fix in permanent stability the number of individuals in the group.

But so soon as the group is regarded distributively, with a membership inevitably committed to the struggle for life, and as, therefore, competitive in its organization or its anarchy, all deductions from the group or collective point of view come promptly under question. The competitive hunt for food need not be taken to increase

in any slightest degree the aggregate provision of food; but the degree of energy and skill or the amount of time devoted by the different individuals to the quest will have much to say as to the distribution of the fixed volume of food available for consumption. The iron law will manifest itself no less relentlessly, but it will manifest itself selectively within the group. The death rate will doubtless rise to a point offsetting the birth rate, the return to effort becoming for certain individuals so meagre and the deaths so numerous as to equate the group death rate against the group birth rate. But the situation being competitive, it may still be true that the more vigorous or clever or industrious hunters in our rat colony may still prosper and still generously multiply — but this obviously only on terms of an offsetting limitation upon survivals among competing rivals or their offspring. The death rate still stands as the effective limit on numbers, but this not in the sense that the limit applies to the group as a whole, or applies equally to the different reproductive stocks or families within the group, or that it applies to more than a small share of the reproductive stocks. The process working competitively, it therefore works selectively. In some sort, truly, there is still a group margin of subsistence, but only in the sense that while some individuals or some reproductive stocks are indefinitely far removed from the margin, others are close to it, still others disappearing over it. The group margin therefore, means nothing more than that there are individuals enough meeting the limit of this margin to offset the reproductive increment from other individuals.

What follows then as to any specific rate of wages within the barn — as to some one rate of remuneration in food hunting? There is quite clearly no one wage return. The rats differ in their effectiveness in seeking

food. As mere restatement of this fact, therefore, it is possible to speak of a unit of return as accruing for each unit of hunting activity directed to the quest. Nor can any meaning attach here to the notion of skill or of effectiveness excepting as appealing for test to the results obtained — results not so much reporting as being the precise degree and precise expression of the skill or the effectiveness. In this view of the case also, the environment is taken to offer equal opportunities to all of the different hunter rats — to be entirely impartial — offering but one wage contract, that of payment according to the specific results achieved. Granted that the different rats differ in their particular adaptations to the opportunities that are open to all, this may readily for the purpose be interpreted as reporting different degrees of productive power within the existing situation. Impliedly always, therefore, there is denied any productivity in the environment itself. The productivity of each hunter is regarded as something inhering in him and attaching to his reactions upon the environment within which, and as limited by which, and as subject to which, his acquisitive activities function, rather than in any degree as attaching to the environment itself.

But further difficulties emerge with the assumption that the activities under consideration are not merely competitively acquisitive but are collectively productive — that the total food product at the disposal of the group as a whole is susceptible of increase by the industry or skill with which the response of the environment is solicited. That in such case the aggregate wage or each specific wage must rise need not, however, seriously put in issue the validity of the iron law for the determination of *certain of the wages* by the food limit, if only the processes of multiplication may be securely counted on to exhaust any temporary margin of food provision,

and if also it may be assumed that the mere fact of labor more prolonged or of skill more highly developed or of stress of effort or of industry more severely felt can carry with it no physical or psychological modifications affecting the tendency to multiply or the rate of multiplication or the distribution of the reproductive activities. If, however, the higher returns upon productive effort, or the stress and strain involved in this effort, or the institutional changes attaching to the methods or the results, may lower the birth rate — the birth rate, note, rather than the death rate — even more rapidly than the death rate is lowered, the net result may be a progressive diminution of population.

But, in any case, it must be clear that, under acutely restricted supplies of nutritive material, survival may be less a question of the product available for the different individuals than of the quantum of nutriment necessary for purposes of survival. It is easily possible that those individuals of the smallest productive efficiency and of smallest derivative returns in product may be precisely those individuals whose digestive and assimilative processes are relatively so efficient as to establish a selective advantage in the competition for survival.

Differential advantages of this sort, indeed, if they are not safely to be ascribed to certain individuals in our colony of rats, do quite obviously distinguish certain races of men. Under an age-long discipline of poverty, the Chinese appear to have evolved a human mechanism exceptionally economical of power relatively to the calories of nutriment absorbed in running it — animals of easy keep, machines astonishingly economical of fuel. There is, then, no secure principle of selection according to the mere test of productive efficiency under the

competitive wages allotted by a homogeneous and undifferentiated environment.

Still further influences bearing upon survivals within our rat colony must attend the establishment of institutions of private property, and especially of the institution of property in the inelastic items of the environment, with the concurrent emergence of habitat rents received as distributive shares out of the aggregate product of food. If that particular nook or corner in which the husbandman (or an overruling Providence) habitually stored his (His) grain, or each crack of escape through which the grain should generously trickle out of the bins, comes to be the particular range or station of certain especially fortunate rats, to be held or ranged over by tenant rats only on terms of generous tolls in favor of the consenting and leasing possessors under vested rights — a further selective principle in the determination of survivals is introduced. Certain individuals or classes will be institutionally withdrawn to indefinite distances from the death line. So far, then, from the selection approximating any general similarity to a group of average marginality between life and death, these more fortunate individuals will be the further removed from menace, as certain other of the race of rodents are approaching the nearer. The progressively rising rental incomes accruing to some individuals or classes will be a function of the progressively increasing rate of starvation among the others.

So, again, were there in this providently provided barn any considerable development of business as distinguished from industry — any class of receivers of nutriment who by social tests were not at the same time contributors — mere toll takers, redundant middlemen rats, tax farmers, popularizers of brands and styles,

advertising experts, engrossers and regraters, poison venders, blackmailers, thug or strong-arm rats, phrenologists, soothsayers, professors or priests of various magics — and so on indefinitely — it might be true that many of the rodents ethically best deserving to die, and by the test of social productivity least authorized to live, and institutionally most effective in creating selective margins of starvation for their fellows, might themselves be raising an increasingly generous progeny on the farthest horizon from the trenches of death.

Much more than the foregoing might presumably be securely written of the economic and distributive institutions, the productive and acquisitive activities, the reproductive tendencies and derivative wage conditions in this classical rat barn, if only one's knowledge in the premises were a bit less inadequate. But, in any case, for average or aggregate purposes, a certain degree of significance must be attached to the iron law of wages in any possible society, if only the quasi-biological assumption of an inevitable tendency to over-multiplication can be accepted as safely applicable. Nor is this assumption finally discredited in its application to human societies by the fact that, in the western world during recent centuries, wages have, with a fair degree of constancy, been more and more widely diverging from the subsistence limit — if all the while, this limit be interpreted as that minimum toll of food calories essential to human life or even as a general necessity limit which shall include clothing, food and shelter. It may still be true that the process of absorbing any margin or slack in production through an inevitable expansion of population is still in an intermediate stage of working itself out, and that only for this transitional period is the increase in the productivity of human labor

rapid enough to outstrip the tendencies toward those increasing numbers for which the high wages have made room. At all events, the recent centuries have been a period of more generous wages and of a widening margin of wages over the minimum necessities of existence.

But none the less have the obvious historical facts prompted a revised interpretation of the method by which wages are determined — an interpretation still directly connected with the tendency toward reproduction, but with a marked difference in emphasis. According to this later view, wages are not determined by the minimum necessities of living but rather by the actually established requirements of living — not by what human beings must have in order to maintain life and to rear replacing offspring, but rather by what they must have if they are to consent to marry — or perhaps to mate — and to rear children. The reproductive instinct, or the opportunity for it to function, must wait, it is asserted — or at any rate actually does wait — on the presence or promise of an adequate margin of income above the habitual requirements for individual living. This standard of living method of the fixation of wages, therefore, equally with the iron law of wages, appeals to a limitation in the number of human beings for its determinant. But under the earlier view, the numbers were to be fixed and wages established through the operation of the death rate. This later view places the limitation on the side of the birth rate. Consistently with this later view the standard of living comes to be defined as that habitual level of consumption any impairment of which will forbid, or at least will seriously restrict, reproduction. Wages must thus express, in terms of the standard of living, the actual conditions under which the population can be secure against a decrease due to the inadequacy of wages.

But it must now be emphasized that either of the foregoing theories, the standard of living theory not less than the minimum of subsistence theory, is in essentials a productivity theory of wage determination. Population tendencies are appealed to solely as fixing the setting within which productive effort is applied to a fixed and inelastic situation — to the conditions fixing the response of nature to human effort — the terms surrounding the exchange contract or the barter transaction between the environment as employer and the human being laboring for hire. The more men there are, the smaller, it is asserted, must be the average return to each. By implication, also, this general or average wage is not conceived as the general or average resultfulness of labor in terms of product but rather as the marginal productiveness of labor. As the number of laborers is increasing, wages fall to the effectiveness of the labor applied at the poorer and poorer opportunities offered by successive marginal qualities of land. In ultimate analysis, therefore, either doctrine is also a distributive doctrine. The better lands as they command rent have by implication attributed to them a productive efficiency by which the rent is to be explained, of which the rent is the competitive price, and through which it is expressed and reported.

Of the subsistence theory of wages, the iron law theory, it might perhaps also be asserted that it is not merely a productivity theory but at the same time also a cost theory of wages. Ultimately the return to labor is held to coincide in amount with the subsistence requirements necessary to the forthcoming of labor. This cost emphasis is, however, more clearly marked with the standard of living theory, in which the factor of consent is more definitely and consciously present. Not only must the wages be high enough to indemnify the cost of

the rearing and the maintaining of any given supply of labor, but also the wages cannot long rule higher than this cost. What the laborers insist on having in wages, as the minimum return at which they will reproduce and maintain their numbers, is therefore at the same time both the lower and the upper limit of what they will get.

Nor are competitive cost analogies lacking for this view. As the price of wheat or pork is in the long run commensurate with the supply costs — as horses and slaves must tend in price to the level of the terms of cost under which they may be produced — as slave hires equally with horse hires or machine hires rest ultimately on a cost determination, so labor hires, it is held, are finally to be explained in conformity with the same cost analysis. In all these cases the supply cost is held to bear on the market rates of remuneration solely through the effect of the changing cost to change the supply, and thereby to change the price terms on which the entire supply can find renters or employers. The agricultural employers' outlay in wages is limited by the environment's marginal response in salable returns. Thus the marginal standard of living reported in the wage is equated against the marginal price returns of food product, within an environment of diminishing response to productive outlay invested in human labor. The standard of living theory of wages is then both a supply, or a cost theory, and a demand, or a productivity theory; the cost determining the supply of labor reacts to fix the product of it.

But there are certain difficulties:

(1) It is not obvious that the supply of men comes about in ways and under influences similar to those effective for wheat or horses or slaves or machines. Child rearing is not now commonly and typically entered into

s a pecuniary enterprise — if indeed it anywhere now
s or ever were so. It is unlikely to pay from any pecu-
niary point of view. And even did it pay, the returns
lo not accrue to the investor. In most cases the par-
nts advance the costs without prospect or expectation
f any sometime indemnity in price return. And com-
nonly the children collect their wages quit of any pur-
ose, bond, or promise of indemnifying the parental ad-
vances. Doubtless in some countries and on some levels
of life exceptions are to be found. But the general rule
holds. And even were this not the general but only the
exceptional case, the difficulties in the cost determina-
tion of wages would be logically not the less serious.
The truth is, that on the side neither of the parents nor
of the children can the psychology or the methods or the
computations be those of enterprise or of business or of
pecuniary gain. Even less than marriage can the rear-
ing of children be held to take place always or generally
as a business undertaking or as promising or affording
justification by this test. No cost of production com-
putation, no balancing of pecuniary debits against ex-
pected credits of indemnity or of prospects of surplus is
either actual or humanly credible. The essential facts
of entrepreneurship, of private initiative for private
gain, are absent. Even could the thing pay — as pos-
sibly sometimes it does — it could rarely or never find
its actual motivation in the prospect of paying. The
pecuniary calculus does not apply — cost of production
at best a remote analogy, and always or generally a
myth. The attractions of sex, the desire for children
and the instinctive urge of the reproductive process are
not business items, or data in any business process or
gainful enterprise. If slave breeding matured only free
slaves, if poultry raising afforded only birds prompt to
fly away at the beginning of their earning period, if

wheat farming matured crops solely for the neighbor's granaries, the processes involved might conceivably continue, but hardly as within the categories of business, of cost accounting and of cost analysis, or as affording results substantially similar. Widow Malloy, famous in song, who could commend her daughter's aspiration to learn to swim only on condition that she avoid getting wet, was toward her son wise and sane in economic affairs beyond most men of learning.

> I've sixteen children, Pat, said she
> Whom God unto me has sent;
> But children ain't like pigs you know,
> And I cannot pay the rent.

(2) Nor is it quite obvious that an increase in the supply of labor must lower the wages of labor. The analogies from consumption goods — hats or houses or horses — is not convincing. To production goods the notion of falling prices with larger supplies does not safely apply. Even with consumption goods it is valid only for those particular goods that are increasing disproportionately with other goods. If the increase in goods is general, exchange relations need not be disturbed by supply influences. If, also, laborers of all the different sorts were increasing in supply not more rapidly than the complementary factors, there is no reason why the wage of any kind of labor should either fall or rise. Thus the assumption of a general fall in wages with larger supplies of labor rests on the concurrent assumption that there is an increasing relative scarcity of the equipment complementary to it — commonly upon the assumption of increasingly inadequate supplies of land — and especially and particularly of food-producing lands, inclusive of food-producing waters. There is obviously no warrant for supposing that with increasing numbers of men the aggregate product must

be stable, but only that with population advancing to lower land margins, the increase in product will not be proportional to the increase in laborers. But, in any case, this situation need involve no very serious fall in the per capita product, and therefore no serious reduction in the level of wages, unless the land rent share of the product is growing rapidly greater. The expected serious fall in wages must, then, appeal as much to the distributive influences apportioning the product as to an expected reduction in the average or per capita product, and must, therefore, take for granted conditions of land supply seriously restricting the increments of product attendant upon increasing supplies of labor.

This assumption, however, of a falling margin of cultivation with expanding population may or may not be justified. Whether with good or with poor land, there may be large areas of either, without marked differentials of fertility in the actual supply. Doubtless the countries of western Europe have furnished examples of populations far outrunning the supplies of high grade land, and cultivating land areas grading sharply downward in point of returns under the actual conditions of agricultural technique. Whether by extensive or by intensive exploitation of the lowering grades of serviceability, the food return determining the wages possible to marginal exploitation must rapidly fall with the advancing pressure for food — prices on foods advance rapidly relatively to the prices of other commodities — rents rise to the great advantage of the land-owning classes, and wages fall, especially in terms of command over nutriment, to the extreme disadvantage of the wage-earning classes. But Asia, eastern Europe and the two Americas with other land conditions might easily have developed other wage tendencies and afforded occasion for other wage doctrines.

But still there is no serious warrant for the belief that standards of living must remain firm against the pressure of the reproductive tendencies. Only when, by definition, the standard itself connotes those things which an increasing family will not be allowed to displace or limit, is the doctrine beyond attack. Standards of living actually do fall, as under other conditions they rise, without the disappearance of the race or the particular class concerned. The birth rate may modify the standards as readily as the standards the birth rate. And not rarely is it true that the lower the standard falls the higher may the birth rate rise — the standard lower because of the higher birth rate, the birth rate rising because of the lower standard — to the point where the rising death rate sets a limit to the further increase in numbers or to the further fall of the standard — thereby effectively illustrating the occasional validity of the forecasts on which the iron law — duly annotated, as we have seen — may occasionally validly rest.

Not rarely also, as typically with (*a*) what are called the Anglo-Saxon races, (*b*) under a competitive organization, (*c*) in the temperate zone, (*d*) at this particular stage of institutional development, tendencies are seemingly becoming manifest, that are seriously disturbing both to the pessimism of the iron law doctrine and to the optimism of the standard doctrine. For not only does a higher level of economic well-being commonly fail to stimulate a higher birth rate, with wages relapsing to a new equilibrium between poverty and death, but instead, a higher efficiency in production with the better wages that attend it appears to diminish rather than to increase the births, to establish in turn a standard of living consenting to fewer children and permissive of still wider alternative gratifications — to the point of putting in question whether there may be any modern

society, retaining its competitive institutions of consumption as well as of production and distribution, that is not well on its way to disappearance as a racial stock. For it is the wealthy nations that manifest the lowest birth rates, and the wealthiest classes of each nation the lowest rate of that nation, so that, despite the falling death rate, both nation and class present a deficit of maturities that is offset only by immigration or possibly by the special fecundity of the newly arrived stocks.

So far, then, there appears to be little validity attaching to either the minimum of subsistence or the standard of living theory in the fixation of wages, except so far as either may be taken to point to the possible effect of changing numbers to modify the conditions under which productivity is determined — in substance therefore, a productivity theory of wages, *distributively annotated* to take account of the distributive process under unfair distributive institutions, and working out into a dubiously beneficent selective process.

But there are other methods by which to equate the wages with the standard of living. Not rarely was it held in classical thought that, if corn rises, wages must therewith follow in rise — not agricultural wages alone, with a possible productivity explanation — but wages in general. For, it was urged, if the laborers did not get wages enough to live on they would die — an outcome, obviously, in which no economist could acquiesce. A man must live. Even if the employer cannot see this, the economist can. Sometimes, of course, there are famines; but these must stand as cases in which the economic law fails to hold — exceptions proving the rule. Most people do finally die of something else than starvation, as obviously they could not, were it not for

the economic law prohibiting in general all deaths from starvation. If recurrently hordes of people die in India for lack of food, this fact should rightly argue the prevalence of bad economic doctrines in India. So, again, that wages are low in Europe has been explained by the low standard of living there — the higher wages in America, by the fact that we in America have come into the habit of consuming more, so that now we have to have it. Thus, again, it is notorious that women get lower wages than men because the women can live on less, or need less, or are helped out by home supplementation, or have their theatre tickets furnished them by their escorts. And thus it follows that if the Chinese or the Japs get into America they will spoil our wages by their low standards of living.

But, however these things may be, it is certain that high wages and high standards go together. As to the causal connection between them, it suffices for the doctrine under consideration, as proof that the standards cause the wages, to recall that if the wages are not forthcoming, the laborers will protest, get discontented or discourteous, appeal to the legislature, or strike or riot. Something, it is clear, will have to give way. Land rents, it should follow, might also be higher if the land owners possessed equally good vocal capacities and were disposed to use them in the proper emphasis. Slaves that talk menacingly, and on occasion rebel, should be expected to command the maximum prices; so horses that bite and kick and balk if they are not properly fed should bring especially good prices and be especially ill fed. The necessary thing to get wages up is merely raise them. If the railroad men get more, other rers will feel that they want more, and in this way be expected to get more. The standard of living risin iculars, it is always the easier to get

it and the inadequate wages higher in the general. Clearly enough, each employer can afford to pay if all the others have to. The easy secret of high wages is in legislation, if the laborers themselves are unwisely slow in raising their standards of living and in formulating the demands which these standards will justify and enforce. Either method of starting will equally well suffice — whether by the wages that establish the standard or by the standard that fixes the wages. But the best point at which to initiate the program is with the minimum wage — thus getting the wedge in at the bottom where it will raise everything. And indirectly, of course, under the rising general standards of well-being and of imperative requirement, the profits of employers will also feel the uplift; interest will rise with the better recognized necessities of the creditor class; and finally also, the landlords, needing more income, can reasonably look for higher rents. Stupid was it that a practical application of this principle had to wait for so many decades after classical authority had announced it.[1]

[1] "There is one point with respect to which economic science, in spite of much vacillation and many misconceptions, has in the main been fairly consistent from the early days of scientific writing down to the present. This is the principle that the rate of wages rests on the traditional standard of living proper to the persons concerned. . . . Advance . . . consists simply in a recognition of the fact that the natural price is measured by a moral standard." Gustav Cohn, Science of Finance, Veblen's translation, p. 259.

"The difference between the advance of relative wages in the two sections of the north was in large measure due to the unlike changes in relative cost of living. . . . Our general hypothesis is that the rise of wages was due chiefly to the increased cost of living. . . . On the average, a single man is better off . . . on a wage of, say, 75 cents a day than a man of family on a wage of, say, $1.25 a day. If this be so, there is the same reason why men in the first of our groups should receive a less average increase in money wages. . . . Similar considerations explain why on the whole the wages of women increased less than the wages of men." Wesley Clair Mitchell, History of the Greenbacks, pp. 306–347, passim. The argument is that since wages and expenditure go along together, the expenditure determines the wages.

"The degree in which women workers may be receiving assistance from their families or other sources is a very important factor in the industrial world, for to the extent that such workers are having their regular wage supplemented by outside assistance, they are able to offer their services in the labor market at lower rates than are workers entirely dependent on their own resources. The most frequent example of this sort of

A somewhat similar tracing of the lines of causation underlay the wage fund theory of the forces fixing the remunerations of labor. Always the total of the wages received by laborers is precisely as large as the capital funds destined to their employment. Wages, therefore, are expected to rise with the more abundant capital of the employers, if only at the same time the laborers themselves do not improvidently multiply. If the employing classes have larger capitals, they can, and in wise policy they will, apportion a correspondingly larger fund to the payment of wages. Thus the welfare of labor is held to depend primarily on the growth of those capital funds in society by which the laborers may be employed, and, secondarily, on the restriction of the numbers of the laborers, through less rapid multiplication or through immigration.

In fact, obviously, this wage fund doctrine made large account of population tendencies and thus afforded further support to the Malthusian tradition. It is susceptible, doubtless, of being interpreted not so much as an account of casual sequences as merely of necessary mathematical relations; what the average laborer can be paid reports the total of wages divided by the number of laborers — the fund to be paid out in wages precisely equal to the funds received as wages. Likewise, a generous reading of certain later wage doctrines into a formulation really innocent of any implications of the sort, might serve to interpret the wage fund theory into some one or another form of the productivity theory. Why was the wage fund thus generous or thus grievously

subsidized labor is that of girls living at home and receiving board and lodging free or at nominal rates. . . . Many parasitic industries and trades have been able to live and even to achieve much prosperity on the subsidies contributed by working women. . . . Industries or occupations, if such there be, which cannot live except on the subsidies from family incomes contributed by exploited women and child workers, ought to die — the sooner the better, for the nation and the world at large." Monthly Review of the Bureau of Labor Statistics, January, 1918, pp. 5, 7.

restricted ? Was it that the employers had on hand a certain amount of " capital " — fluid funds, that they were desirous of parting with — revenues for which they had no more satisfactory method of distribution than to pass them over to whatever men there were of a creditable willingness to labor and needy of money ? But, more probably, what these competing employers were disposed to pay out would tend to reflect in close approximation the results which the labor promised — coming events casting shadows before — gains in prospect motivating present investment.

But even so, and interpreted as a productivity doctrine, some process of imputation is necessary on the part of the employer — a preliminary distributive appraisal of the items of labor in their marginal significance as coöperating and contributory factors of production, taken in their relation to other productive factors, so that employers should be able to find the limits of their wage offers.

In still another interpretation, the wage fund theory is allied with the doctrine that it is only through capital that labor receives employment. And this doctrine, in turn, subdivides into the notion (*a*) that in industry as well as in business, the initiative and leadership attach to capital, (*b*) that capital subsists labor during the gain, or the production period, and (*c*) that the effectiveness of labor in gainful employment, and therefore its wage, must be determined by its equipment — the tools and the implementation with which it is capitalistically fitted out.

Later theory would, however, pronounce that the directive and initiative function is not with the capitalist but rather with the entrepreneur — the functions of the entrepreneur as employer being as clear with reference to capital or land as to labor — his costs including

capital hires equally with labor hires — all his expenses of production paid out of capital, whether his own or borrowed. To set up an employer is not to determine the wages he pays by the capital he owns or can borrow, whether this capital exist in the form of funds or of machines or of land.

That labor is subsisted by capital may be tentatively admitted, without the implication that it is by the capital of the employer; perhaps it is by the laborer's own capital. Lawyers and doctors also must often wait long for their fees — sometimes without term. Laborers may or may not be paid in advance of the marketing of their products. But certain it is that commonly they are paid appreciably later than the services were rendered. And, in any case, if the subsistence goods are the *capital* under analysis, the employer is rarely possessed of any of these goods of subsistence; instead it is the merchant that makes the advances, as is sufficiently indicated by the number of his poor accounts to go to swell the bills against those customers from whom he does actually succeed in collecting. If the laborer is to live, he, doubtless, like all others who live, must live on the comestibles and in the houses and on the lands that are in existence. But even tho these be not his own, there is no evidence that they are the capitalist's or that the rate of wages reports the current supplies of comestibles, or is determined by the volume of them. If it be urged that the laborer's paying power is, after all, traceable back to his employer, it is likewise equally to be asserted that the employer's paying power traces back in turn to the intermediate man who handles his goods, and finally, therefore, to the consumer of his products — namely, often, to the laborer.

There is doubtless more of truth in the view that the laborer's earning power and his derivative wages are,

o a great extent, dependent on the capital equipment vith which he works. But *capital* in this sense is not the apital of the wage fund discussion, nor is it the capital vith which the initiative in enterprise can be asserted to ie. Nor can it be true that the kind of equipment letermines whether the laborer shall or shall not work t all, but only the terms of effectiveness at which he vorks. That scant or poor tools mean the impossibility f employment, or little employment, observation and istory unite to disprove. In societies of poor equipnent, there is likely to be the fourteen-hour day — the vomen and the children toiling together with the men. To say that with only half as much capital, I could mploy away from my competitors only half as many nen falls short of proving that, if all employers had half s much capital, the aggregate of employers could emloy only half as many men. But however all this may e, this particular view, it should be noted, shifts again he meaning of *capital* back to the concept of a fund ather than to the concept of equipment. In which of these two meanings Adam Smith was employing the term in his well-known doctrine that " the number of useful and productive laborers is everywhere in proportion to the quantity of capital stock which is employed in setting them to work, and to the particular way in which it is so employed," [1] it is difficult to be certain. But perhaps it does not matter; Adam Smith's theoretical work was rather an anticipatory anthology of all the later divergent doctrines than a consistent and systematic application of any one. In any tenable view of the question, at all events, the analysis has again implicitly to include distributive forces and adjustments. If the worker has good rather than poor or scanty equipment to work with — especially if it is not

[1] Wealth of Nations, Introduction.

his own equipment — there is always the question of how much, if any, of the larger aggregate result will go to him, as over against the better equipment that made the larger result possible. The view has long been widespread among wage earners, that the machine owners absorb in rents or profits or interest all of the larger product due to the machines, at the same time with depriving many laborers of any employment at all. That such is not the fact — assuming that it is not — could obviously be established only through a distributive analysis. But it is evident that the doctrine that each factor receives whatever it contributes can deny the exploitation of labor only on terms of denying also any distributive advantage to it — the presence or the absence of the equipment being irrelevant to the wage.

No account of the logical relations among the various wage theories can find a ready place for the labor-pain notion of wage determination. But interpreted either in the Crusoe or in the collectivist emphasis it makes a fairly cogent appeal. The independent worker finds his limit of productive effort at the point of equality between returns and sacrifices. Being equal magnitudes, either marginal utility or marginal cost might equally well be urged as the common denominator of products. So, under competitive wage relations, each laborer, free at any instant to work or to refrain from working, would find his own particular point of equality between the remuneration for his labor and his protest against labor. Here, as always and everywhere, the marginal relation is one of equality between inducement and resistance. But in its very nature it is a ratio between quantities rather than itself a quantity. Even any one laborer, varying at different times in the intensity of his desire for goods and in the health or strength or vigor to

labor and in the degree of burdensomeness attending his productive exertion, would find the equality ratio always a changing one in point of the quantitative inducements and protests equating under it. The clearer, therefore, is it that equal wages for different men can imply no equality between the respective sacrifices undergone, but only an equality for each between his marginal sacrifices and the returns — this ratio being always of unit value, but the quantities involved being indefinitely divergent. Wages cannot vary to accord with individual sacrifices — pains a common standard of inter-individual wages. It is then to be recognized that at best the sacrifices in labor (1) are a common denominator to any individual for one particular time only; (2) and then only at the marginal fringe between efforts and returns; and (3) are entirely inapplicable as standard or measure for the wages of different men.

It is further to be noted that the sacrifices of labor include not merely the stress and strain of effort — the pains that attach to that sweat of the brow by which some of us eat bread — but include also for many men the displacement of the affirmative gratifications offered by leisure and by the time-consuming spending process.

And still further: Under any possible emphasis, this pain or sacrifice theory of wages is, in its own particular sort, a productivity theory. The sacrifices as the supply limiting fact equate against the prospective product or the offered wage as the demand fact. The wage-paying disposition of the employer is based on the price gain in prospect for him; is limited by the prospective contribution to price; is motivated by productivity in the sense of proceeds, *Ertrag*, returns.

Thus far, indeed, all the different wage theories are productivity theories. And, excepting in the socialist

or surplus value theory, the logic of the competitive process assumes a point of marginal adjustment at which the receipts of enterprise are at an equality with the outlays or costs — demand equating against supply. The way is thus clear for an examination of the theories of a more modern tenor.

It is, in truth, no simple task to discuss the productivity theory of wages, precisely because there is no one productivity theory, but only a group of more or less closely interrelated theories. It is safe to say that practically all non-revolutionary economists of the present time hold some one or other form or forms of it — each economist at least one and not rarely several — each theory so held being variously articulated with one or more other theories — subsistence, standard or wage fund — and possibly with more than one variety of each of these others. There is, in fact, no difficulty in holding the subsistence theory or the standard theory, at the same time with some one or another productivity theory. The difficulty is really just the other way about. The earlier theories appealed in substance to an implicit productivity analysis, naïvely held doubtless, and without distributive emphasis or supplementation. Almost as much, tho perhaps not quite so securely, might be said of the wage fund theory in such of its aspects or subdivisions as, being more than mathematical truisms, purported to have analysis of any sort behind them.

Otherwise than in connection with some implicit ethical or apologetic emphasis it is probable that no socialist need — no matter what socialists actually do — be any the less a socialist because of his adherence to a consistent productivity doctrine. So equally of the single taxer. The condemnation of private property in

any of the tools of production, land included, or the condemnation solely of private property in land, need in no sense be inconsistent with the recognition of the most precise correlation of the earnings of the machine or of the land with the distributive share competitively allotted to the owner of it. The merits of private property in land are not to be deduced from any conclusion that the rent is or is not too great or too small, or is the precise equivalent of what the use is competitively worth — the precise correlative of the contribution of the land factor to the saleable product. The question is not how much rent the land should command, but for whose benefit the rent should accrue — to what proprietorship, private or public, it should attach. The single taxer is, in fact, a thoro-going believer in the competitive order. To him rent is a competitive category, and is the more iniquitous as the competitive process is working the more completely and precisely. It is, therefore, no part of his case to prove that the rent is overgreat or oversmall. Nor need he either deny or assert that it is precisely what it ought to be, its specific "worth" — an ideally fair case of bargaining between landlord and tenant. Whatever the landlord gets, be it much or little, and no matter how fairly charged, the landlord should not have it. It is the personal and not the functional distribution that the single taxer puts in question. So, again, the socialist need not the better like the institution of private property in any productive instrument, any item of technological capital, were he convinced that the distributive share competitively awarded to it expresses the result of an entirely fair bargain between owner and hirer — no greater charge, for example, than a fair state might impose for it, were the state an owner leasing out the property.

It is no doubt true that the socialist rarely or never thus presents his case. Commonly, indeed, he holds a wage theory fundamentally inconsistent with the productivity theory in any one of its forms — a theory yet to be considered with the utmost care.

But the view is that the distributive processes of competition are fair and salutary in the precise degree that they approach the completely competitive norm — involve no monopoly, eliminate friction, take place under an open, intelligent, watchful bargaining, are competitive to the utmost implicit competitive logic — that such a perfect competition is so far a perfect ethics as to discredit by ethical tests any system or process arriving at other distributive results — such a view involves the assumption that income competitively gained is not merely derivative from social service but tends to be approximately commensurate with social service — that all gain reports and represents not merely additions to aggregate product but contributions to a socially beneficent product and a remuneration commensurate with the social service attending the product. All gain is, therefore, ethically righteous, self-warranting, and justified, in the degree that it is achieved in harmony with the competitive process.

There is, obviously, not now the space, as, it may be hoped, there is not now the need, to go far in examination of the ethical aspects of the distributive process in any competitive order, perfect or other. I have elsewhere sufficiently insisted that, if either validity or intelligibility is to be ascribed to the productivity theory, it can be solely through interpreting *product* to mean merely *gain* — returns, *Ertrag*, proceeds. The distinction between industry and business is sufficiently obvious. And if ever the lack of necessary coincidence

between private gain and social welfare has gone unregarded, these current years of war are making it sufficiently manifest. That one is manufacturing candy at good margins, or desires joy-riding gasoline and buys it, or can afford himself more wheat bread than he can wholesomely eat, or, being possessed of the funds for building a house, compels the ships to go unbuilt, or, as financially competent to keep his house luxuriously warm, brings it about that others shiver, or is gainfully employed as producer or enterprisingly engaged as consumer in directing advertising flares out into the interstellar spaces — in none of these cases can the mere fact that the thing is done be the adequate certification of its rightness, or of the solicitude for the aggregate welfare that prompts it, or of its actual significance under that test. The strong-arm man serving for pay under a contract duly executed may be fully worthy of his hire, and yet, having earned his murder fee, be none the less a criminal — his employer also only something the less a rascal that he does not default in the promised payment. For the purposes of the contract and by its test the honest man may be merely the man who stays bought. But the equities inside a contract are not self-warranting by the exterior social test. The thing promised to be done and honestly fulfilled may still be a colossal dishonesty. Competitively speaking, Fagan's pickpocket urchins earned their evening's dole as obviously as their regular cuffings. They were *producers*. But their wages no more established their social deserving than the cuffings their transgressions. What under the ordinances of competition one gets gives no safe report of what under the ordinances of God he deserves.

And as, even in the distinctly industrial field, it is possible to burden the productivity beyond its carry-

ing capacity in institutional and ethical aspects, so too much may be demanded or asserted for it in point of precision. The fact that it is a theory of distribution — that the distributive processes are the very subject matter of it — should have stamped as hopeless any attempt to isolate precisely the separate price product of any factor that, never functioning separately, has no separate product, or to establish the precise equivalence of the hire with the contribution toward an industrial product jointly produced by several factors. Even if any entrepreneur could for his own purposes isolate and make precise the separate significance of any of the coöperating factors, there is nothing to indicate that the payment imposed upon him is this full and precise equivalent. And — still assuming this ability on his part — each employer must arrive at a different appraisal. Actually no one of them could arrive at any — or would have any need to — in any other sense than that of determining what reduction in price results for him the lack of any item would carry with it, what he could, if he must, at the outside pay rather than go without it — which is not at all the same thing as to determine what it produces. What accrues with its presence is partly the expression of the greater significance of the other factors functioning together with it. What is lost by its subtraction is the breaking up of the group, and is thus a subtraction from the significance of each of the different members of the group, to the extent that the significance of each individual member is reflected to it by the group relation. Some part of the significance of the subtracted member is itself dependent upon the group relation. The loss attending the breaking-up of the group attaches to the subtracted member equally with the other members. All were in the group — were brought in and should remain in —

because in the interests of the maximum result it is not well that they be separated.

If this point should be still not altogether clear, test it by recurring to the rent and wages relations in the cultivation of land. The application of more and more labor expense to land brings about a larger gross return — increased money outlays for labor bringing an increased money return from the property. But, in the competitive distribution of the new aggregate of money product, the rent share is an increasing quantity; which is merely to say that there is now allotted to land rent some part of the increment of product casually due to the application of more labor. To assert that the land produces more, now that it gets more, is to say that because the land gets part of what the laborer added, it was the land that added it. That the land gets more is merely a corollary from the familiar distributive law that, with any change to the proportion of the coöperating factors, it is the factor that is becoming relatively scarce that gets the relative advantage in the new distributive allotment of the new price product. If, for example, one hundred units of labor applied to free land achieved one hundred dollars worth of product and entirely absorbed in wages this one hundred of dollar units — a per capita wage of one dollar — a doubling population, working under conditions of diminishing return, will achieve results, we will say, of one hundred and eighty dollars — a per capita product of ninety cents. But this is not at all to infer that the wages will fall merely from one dollar to ninety cents. Land rents emerge. If the rent is thirty, there must remain only a total of one hundred and sixty to be divided among two hundred labor units — the wage not ninety cents but eighty. The increase of ninety of product, casually due to an increased supply of the labor factor, is distributed

to the extent of only two thirds of it to the factor achieving it; one third of it is allotted in the distributive process to the advantage of the land factor. The wage share therefore suffers in two aspects — first, a smaller sum per capita to be divided; second, a smaller fraction of what there is to be divided. No distributive problem admits of a correct solution by asking what increase in the amount to be distributed is casually attributable to any changing factor. Always there must be the further step of taking account of the changing ratios in the distribution. And this is merely to say that distributive doctrine must finally always be distributive.

It remains merely to note a curious case of mixture or confusion of two wage theories which taken separately have certain potencies of service — essentially a misjoinder of two doctrines, each good within limits when taken separately, but which, when together, result in either a futile neutrality or a menacing new compound. The standard of living wherever it works out, as occasionly it does, through a restricted birth rate into a limitation of population has, as we have seen, some inevitable bearing on wages — a productivity analysis, albeit implicit and unrecognized. The view under criticism, however, ascribes to the standard of living the rôle of fixing the supply of labor, and to the productivity of labor the rôle of fixing the demand.[1] But if the supply of labor has itself no bearing but to affect the productivity, the doctrine in question appears to lack something in its logic.

The same lack, but in the inverse direction, infects the socialist, the surplus value theory of wages. Borrowed

[1] See, for example, Professor T. N. Carver in the March, 1905, Journal of Political Economy, vol. xiii, p. 263.

om classical thinking, it is purely a supply doctrine f wage fixation, wanting entirely, however, any final ppeal to the marginal productivity influences implicit ı the original doctrine. There can be, it is clear, no xploitation of labor, no surplus value, excepting on the ssumption that the product furnishes to the entre- ıreneur — or to the capitalist, as the Marxian puts it — ı value product in excess of the labor hire at the sub- istence level. The subsistence costs establish a wage for labor, so the doctrine runs, indefinitely widely divergent from the price product that the labor affords. Thus all the significance of improving technique is absorbed in interest or profits. But none the less the doctrine retains the Malthusian emphasis; it is still a population doctrine. The larger supply of laborers depresses the wages, not by lowering the margin of cultivation of land or the marginal per capita product in industry anywhere, or by the more plentiful supply of labor relative to capital goods and the attendant unfavorable distribution of wages, but only through the constant pressure of famished hordes of laborers bidding down wages to find employment. It is solely the hungry competition of these out-of-works that affords capital its leverage of exploitation. If the laborer with a job demurs at his subsistence wage, there are always out-of-works to take his place — labor turnover and employer gain going together. The enormous gains that are accruing to employers fail somehow to evoke a competition effective to eliminate these gains. Lands and machines, it is held, receive remunerations competitively fixed; but with labor and wages there is only the competition of the units of supply against one another. With horses and mules, the hires report an equilibrium between marginal costs of production, fixing supplies, and the marginal productivity, as manifested under the conditions

of the actual supply. But with labor it is not so; marginal cost and marginal product do not equate. Hence the wage system is an institutional exploitation. The supply aspect of the facts is alone taken into account. There is no appeal to productivity; nor is any distributive analysis attempted.

It is perhaps sufficiently clear that I have no quarrel with the productivity theory either for wages or for the entire distributive process, as a large and general account of the competitive facts, if only *productivity* is interpreted in the sense of *proceeds*, if all ethical implications and inferences are eliminated, all institutional justifications avoided, and all inherent and specific productivities disavowed. There is no better reason for regarding the wage of any item of labor or the hire of any instrument as the precise expression of its efficiency for purposes of gain in enterprise than there is for regarding the price of a pound of tobacco as the precise report of its desiredness or aroma or nutritive quality or of its aesthetic or ethical worth.

But when once these limitations or corrections of the productivity doctrine are recognized and the attendant restatements accepted, the way is cleared for certain important applications of the productivity doctrine to questions of general welfare, and particularly to the wage problem. The time has arrived, as I believe, for a fundamental restatement of the problems of low wages and of poverty. I take it to be an entire misconception to believe that much can be achieved for the laboring classes through inducing or imposing larger wage outlays on the part of the employer. No important or general increases of wages are possible — the wrongs to labor in no considerable degree being with the employers.

se employers are subject to competitive conditions, have not, and cannot have, in the large and the long seriously wide margins of gain. Nor can they, advantageously to the wage earner, be deprived of these s. In general, then, the problem is not how to raise es or other artisan incomes, but how to protect from loitation these incomes after they are once received ot the question why the wages are so small but why buy so little — the régime of exploitation of the sumer by various methods of franchise, privilege, lation, fraud, political guile, private property in al wealth, multiplication of waste, expensive des for defeating justice or for making illegal things l, unjust and favor-dispensing taxation — all of e things that now and then we all recognize and lore. But I insist that these things taken in their ulative effect are the explanation that so large a tion of the population, possibly 30 to 40 per cent, is g at the expense of the rest of the population — explanation why so little gets produced and also the producers are defeated of getting it — defeated in the primary process of getting wages for their r, but in the further process of getting goods for r wages. The wages buy under present conditions less than they ought to buy. I am convinced that to ate in the other emphasis is merely to becloud the e. To state the problem wrongly is to make stronger defense of wrong; to prosecute the wrong man is to the game of the culprit. More emphasis needs to given to plans for getting revenues by other methods n by putting up the prices of goods against consers. Income taxes would be good — far better than house taxes that make rents higher. Inheritance es are still better than income taxes, and would go her to diminish the handicap of heredity by which

the disinherited classes always greatly suffer. And it is true also that under right methods of collecting government revenues there need ordinarily be no taxation at all, if only the enjoyment of special privilege — inclusive of the privilege of overcharge in one way or another — were outlawed. Far better than the taxes that make the rents higher would be the taxes on the lots. The tenant pays tribute also to the steel trust, to the timber owners, to the lumber dealers, the glass trust, the bath tub trust, all in the form of house rent; pays tribute to the mine owner for the coal on the mine sidetrack; and further tribute to the franchise owner in order to get the coal carried; pays by tariff more for his clothes, in order that the manufacturer may have a privilege; pays other tribute if he travels; still other when he dies — to the coffin trust and to the real estate speculator who owns the cemetery — finds, indeed that between the exactions incidental to getting into the world and the other exactions imposed on getting out, he must take no risks of having children; is robbed by all sorts of other plunder plans in ways which the law does not sanction; and still finds that by the expense of litigation which the law does sanction if he seeks a remedy, it has practically denied the remedy, and that thus an automatic safety is guaranteed to numberless other plunder plans. The profits of the steel trust this year are running at the rate of twenty to thirty dollars per family — one among the hosts of trusts — an annual gain approximately double the original value of the steel corporation investment. The cities are not rare in which the streets are lighted for the business men out of the taxes paid by consumers in higher rates. Low taxes on business property multiply the investment in palatial business buildings on which the consumers of goods are summoned to pay the rents accompanying the competitive struggle for patron-

age. In these shops the buyer gets two cents worth of cereal, with a loading of thirteen cents for carton and brand and publicity outlays. Puffed wheat at fifteen cents a package of four ounces means wheat at thirty-six dollars a bushel. For a dollar the purchaser gets a glass bottle, a glass stopper, a velvet leather cover on the stopper, a ribbon around the stopper, an art label on the bottle, an artistic box, another art label on the box, a wrapper and string around the whole purchase — and inside two cents worth of cologne.

There would, however, be less protest from the point of view of the purchasing power of the wages, if these expensive street lights — which consumers in general pay for — carried with them anywhere a social service. So far as they are items of expense in competitive advertising, they do not. If, likewise, the low taxes on business property were returned to consumers in the guise of lower expense loadings on purchased goods, instead of working as a stimulus to the erection of still more expensive structures — the higher costs of which must be remunerated in higher business rentals and in turn charged over in the sale prices at which the consumer gets his goods — the situation might yield some solace. In truth, however, the theory of wages is not complete till account has been taken of the bearing of merchandising activities on the purchase prices of goods.

With respect to the ordinary outlays for advertising, for sales people and for commercial travelers, it is clear that in the large these costs are included in the retail selling price. The costs of selling the goods to him the purchaser buys with the goods — with something additional for margins. Perhaps salesmanship could be defined as the gainful art of selling the costs of selling.

But there is obviously danger here of mixing things. The wastes of competitive merchandising are not rightly ranked with monopoly, bad legal systems, blue sky juggleries, unearned increments, the traffic in nostrums, unequal taxation, private property in privilege. The sole principle of unity is in the common bearing on the purchasing power of wages. Nor to certain of these influences is it safe to deny all bearing on the amount of the money wages received.

In any case, merchandising and salesmanship rank quite clearly among the many forces to explain why the wages, once they are received, buy so little, as also to contribute to the explanation of why they are so little. Illustratively, therefore, salesmanship is especially to the immediate purpose. Space fails for even an adequate catalogue of the various items of charge to be included in the prices paid by consumers — costs of making the goods more attractive than those of one's competitor, or more conveniently available, or better known, or better acclaimed in quality, or more appealingly presented, or of stricter vogue — rents of business locations, expenses of furnishings and fittings, attendance, delivery, newspaper advertising, bill boards, electric displays, packing, wrapping, cartons, labels, ribbons, rest rooms, restaurants, concerts, subscriptions to public undertakings of entertainment or charity, sales forces, solicitors, traveling salesmen, demonstrators, insurance, taxes, light, heat, storage — charges without end, some of them doubtless inevitable, and not a few of them connoting important services. It is their summed-up cost that is appalling. And still more appalling is the lack of any theoretical limit to their increase. So long, indeed, as the producer or the merchandiser finds it possible to sell indefinitely more goods at high prices than at low, providing that with the in-

creased price there goes something like a corresponding increase in selling outlays, it will be true that competitive success will turn on resourceful salesmanship. And thus, more and more, enterprise comes to be a contest of wits in selling to consumers the costs of selling to them.

It is to be recalled that these marketing activities embraced within the inclusive term *salesmanship* are not merely offensive in purpose and effect, as the necessary costs of getting a competitor's trade away from him, but are equally defensive, the necessary costs of keeping the trade that one has. They bid fair to grow with the passing years, as so far they have grown. The rising costs of doing business are as much a commonplace with the retailers as with their critics. The fault is one of process rather than of persons. When manufacturers' and jobbers' costs are included with wholesalers' and retailers' costs as making up the aggregate outlays of sales departments and of separate enterprises of sale, it probably is not far wide of the truth to fix at 50 per cent of the consumers' price the charge competitively imposed for these intermediate activities. This percentage may easily be overlarge. Or, equally well it may run appreciably short of the truth. At best it must be not better than an average of averages. Actually it is something short of this.

In any case, so far as these intermediate charges have significance solely for competitive offense and defense, or are due to the excessive subdivision of the retail traffic, or to perplexities of brand and trademark, they are mainly, if not entirely, social wastes. Some of them — as, for example, the colossal ground rents which city merchandising explains and city merchandising pays — may in no great part go to enhance marginal selling costs. But in the main, it is clear, the consumer must make good all sales charges. Merchandisers' rivalries

being rather competitions for clientele than competitions in prices, the process tends rather toward larger than smaller expense loadings. *It pays to advertise* formulates in familiar terms a truth of wide competitive application.

It is, however, in its distributive aspects that the development of salesmanship comes to be of especial illustrative interest for the theory of wages. Salesmen are paid salaries on precisely the same basis of business policy as mechanics and artisans are paid wages. Directly, all are distributees out of the particular fund of the employer's receipts, indirectly, distributees out of the great fund of the aggregate social dividend, their remunerations equally and under the same title cost outlays incurred by the entrepreneur as means to his ends of individual gain. Each is therefore productive to the entrepreneur. For all of his purposes, and therefore for all of his distributed remunerations, no distinction exists between industry and business or between mechanic and salesmen. He pays for either accordingly as he must in achieving his purposes of gain. Thus it comes about that merchandising and salesmanship, as particular items in the general competitive process, afford an effective illustration of a wide range of forces and influences bearing in the actual competitive process either to limit the fund of products out of which laborers in general can be paid or, in addition, to diminish their relative shares out of this aggregate product.

If, then, more and more in business policy, the sales process tends to overshadow and to displace the mechanical process — the selling activity to acquire importance as against industrial activity, business investment flowing into salesmanship rather than into

technical processes, the science of advertising acquiring an importance surpassing that of technology, skill in selling things taking precedence of skill in making things — it must follow that for artisans and mechanics there is a narrowing demand, in precisely the measure that the demand is widening for other abilities and activities better suited to the business purpose. Out of the price at which the consumers buy the goods, a diminishing share is therefore allotted to the factory process, for distribution to the artisan laborer. The pay-roll is the scantier for the mechanic as a more generous share of it is appointed to the advertising expert and the commercial traveler. The wage fund for one class of laborers is diminished to the advantage of a substitute and competing class. Investment forsakes the mechanical and industrial field for fields of greater return. The place and wage of industrial labor are, in some sort, a residuum available only after other and more important matters of the play have been considered.

But this is not the entire case. Any labor, wasteful or parasitic under the test of social serviceability, participates in the distributive process with no corresponding contribution to the social dividend. So far, then, all distributive shares, wages with the rest, may be assumed to suffer. But the salesmanship function holds the competitive, the substitute, relation to all mechanical and industrial functions. From the point of view of any particular industry, doubtless, the factory process and the sales process are complementary. Each must be if the other is. The goods must find a market else they cannot be made. But this is only competitively true — true for each particular industry in the rivalries of business. It does not hold of production taken in the aggregate. From the collective point of view, these processes of ornamentation, display, advertising and solicitation

displace the mechanical and industrial processes. Not more mechanical and artisan labor is applied because of marketing activities, but less.

In the aggregate, therefore, all gainful ways of employing labor that are not also socially productive are waste and nothing more; the social dividend suffers with no diminution in the number of claimants against it. But in the competitive process the distribution of the diminished product is also modified. The increased emphasis for gain-getting purposes on the activities displacing mechanical and industrial labor, redistributes the total share to be allotted to the labor factor to the marked disadvantage of artisan wages. There is, that is to say, a distributive change in the relative shares allotted to the different grades and varieties of labor, a redistribution within the labor group. As the substitute and competing laborers get more, the artisans and mechanics get less. Not merely do these last share in the loss attending a diminished social income of concrete things, but also they are subjected to a disproportionate share of the loss. They are the chief sufferers through the entire process — the distributary legatees of the cumulative deficit.

All this is not so much a novelty in distributive theory as, in the main, merely a neglected application of principles long established. Where certain of the factors in a joint process are becoming more expensive the others suffer. Those becoming relatively plenty become also relatively cheap. But it has not been quite clearly recognized that in the processes of competitive rivalry, and by the standards of these processes, there are other than mechanical and industrial factors. There are business factors, equally productive by the test of gain. Advertising, for example, is such a factor. Salesmanship in the large is a group of such factors.

Thus it must be recognized that all parasitisms, predations and wastes bear adversely on the distributive process in the large, because they bear adversely on the total of goods to be distributed. Incomes have, then, to suffer in the average, wages with the rest. But some of these adverse influences bear in especial degree on wage earners in the spending of their incomes. Others impose in addition on a particular class of laborers, the artisan and mechanic class, certain peculiar distributive disadvantages. The theory of wages needs in general, then, supplementation to take account of the difference between competitive acquisition and social production. It needs to take special account of the peculiar bearing of certain gainseeking activities on the wages of artisan and industrial laborers, not merely (1) in what their dollars will buy after they are collected, but (2) on the number of dollars that are received.

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THE TAXATION OF LUXURIES AND THE RATE OF INTEREST

SUMMARY

I. Luxury defined as consumption which does not increase capacity for labor, 298. — Superfluities include consumption necessary for business connection, 300. — Short and long periods, 301. — Capacity for labor varies with consumption of necessaries, 301. — Classification of commodities, 302. — II. Demand for necessaries inelastic because (*a*) their consumption benefits both present and future, 304. — (*b*) Capacity for labor is limited, 306. — A tax on luxuries would divert labor to production of capital, also lessening demand, 307. — Labor would become more productive and real wages would rise, 308. — Wealth would be increased, 309; and transferred to people whose effective desire of accumulation is strong, 310. — III. Possible decrease in quantity of labor expended, 314. — Self-development not labor, 315. — Leisure, defined as time not devoted to labor, is either necessary or superfluous, 316. — Annual product varies inversely with superfluous leisure enjoyed, and might be either decreased or increased, 318. — Rise of wages might check fall of interest; convergence of altruism and foresight, 319.

I

THE proposition that " a tax for purposes of revenue should have the least possible prohibitive effect "[1] seems fundamental to the system of *laissez-faire*, and has been accepted, expressly or tacitly, even by writers who in general regard that doctrine with disfavor. But such a proposition cannot be established unless not only some but all of the repressive effects which taxes may have are examined, and found on the whole to be undesirable. It cannot therefore be a bar to the consideration of a tax on luxuries. In the present essay an

[1] E. A. Ross, " A New Canon of Taxation," Political Science Quarterly, December, 1892, p. 579.

attempt will be made to show that such a tax would have a tendency to reduce the normal rate of interest. To this task the discussion will as far as possible confine itself. The question of general expediency, which would seem to involve a careful comparison of incommensurable evils, must be understood to transcend the limits of this inquiry.

It is convenient to begin with a definition. "Consumable commodities," writes Adam Smith, "are either necessaries or luxuries." [1] If we adopt Professor Fisher's conception of income, and use the word consumption as the equivalent of what he calls "enjoyable objective services" — that is, including labor which satisfies wants directly — we may say that all consumption must be either of necessaries or luxuries. Let us now define necessary consumption as that which increases the consumer's capacity for labor. Luxury then becomes definable as consumption which does not increase this capacity.

At the outset we notice that, owing to the division of labor, an individual cannot attain his maximum productiveness without coöperating with others. To be able to do this with advantage, he must in a measure enjoy their confidence and good opinion. That of possible employers or customers is of most importance, but a person cannot regard anyone's estimation of him as a matter of perfect indifference, as is shown by the pecuniary value occasionally attached to reputation, which, be it noticed, is not entirely dependent on the direct satisfaction which a good reputation affords, but in all cases bears some analogy to business connection. Now A's opinion of B partly depends on whether B's consumption, or expenditure, is sufficient to bring his standard of living into conformity with what A con-

[1] Wealth of Nations, Bk. V, chap. ii.

siders suitable to one in B's position. And A's ideas on that head are chiefly determined by what is consumed by others in circumstances similar to those of B. Thus, to attain his maximum productiveness, B must make his consumption conform to a purely arbitrary standard, and all expenditure within those limits is, from his individual point of view, in the strictest sense necessary.

The point of view of the private individual, however, must be distinguished from that of society as a whole. From the latter standpoint, it appears that part of every man's consumption is necessary in order that he may develop his productive powers as they are affected by his physical, mental, and moral qualities; and part is necessary merely because other people are accustomed to indulge in such expenditure. The latter part of consumption might be called relatively, or, if I might venture to adopt Dr. Marshall's term, conventionally necessary.[1] From the social standpoint, however, such consumption is not necessary, but is purely a luxury, inasmuch as it does not, in itself, increase capacity for labor. The term superfluity might be used to denote consumption covered by the above definition of luxury from the social point of view, including both what an individual would regard as luxury, and that which is relatively necessary. This terminology would appear conformable both to economic authority [2] and to general usage.

The term superfluity, then, is more comprehensive than the term luxury. The distinction between them, however, is not only vague and hard to draw, but is constantly changing. It is often said that the luxuries of one generation become the necessaries — that is, " con-

[1] Principles of Economics, Bk. II, chap. iii, § 4. The term is there used in a sense which I believe will not be found to differ substantially from the above. See also Dr. Marshall's whole treatment of the subject of Necessaries.

[2] See Sidgwick, Principles of Political Economy, Bk. I, chap. iii, § 3.

entional necessaries" — of the next. The tax here to e considered is primarily one on luxuries, but I shall ssume that it would be extended to superfluities to an xtent sufficient to prevent the standard of living of any ass from rising otherwise than in conformity with an ncrease in productiveness.

The social point of view must be further distinguished ccording to whether a short or a long period is conmplated. In a short period, anything which necesstates a considerable change in people's habits will eriously impair their efficiency. On the other hand ney can do without many things, such as moral guidnce and art, the want of which would greatly lessen heir efficiency in the long run. The longer the period onsidered, the less account must be taken of habit, but he more must be taken of things which contribute nly indirectly to efficiency. In a period sufficiently ng for every tendency to work itself out, a man could e thought of as a perfectly rational being, and his kes and dislikes, which are of such transcendent imortance for shorter periods, could be entirely disegarded. The determination of what things may be ecessaries and what superfluities would then fall ithin the province of natural, or at least non-social ciences, such as physiology. The present discussion hroughout deals only with ultimate tendencies, and he conception of necessaries must be interpreted ccordingly.

The above definition makes it possible to lay down he proposition that the aggregate capacity for labor of ny society varies in the long run with the amount of ecessaries consumed. Both will tend to vary with the umbers of the population, but not necessarily in the me proportion, for a given amount of work can be one either by a smaller number of intelligent and

highly effective workmen or by a larger number of an inferior sort. This proposition also holds good regarding an individual. Indeed, it is with reference to it that the definition of necessaries must be tested.

I am obliged to face the consequence that a particular thing may be necessary under some circumstances and a luxury under others. The two classes of commodities do not in general differ in kind. It does not follow, however, that the theoretical distinction is impossible of application. Professor Taussig, after remarking that productiveness depends partly on the average laborer's strength and skill, observes: "Men can live and do work for less than is necessary to enable them to do full work. The minimum for efficiency is above the starvation level. But when once they get what is necessary for complete physical vigor, anything in addition is mere surplus; surplus, that is, in that it no further increases efficiency." [1] Now this appears to be true not only of money income, or commodities in general, but of particular commodities as well. It seems usually to be the case that as successive instalments of a commodity are consumed each has less and less effect on efficiency, till finally the point is reached when additional units would have none at all. The consumption of the commodity need not cease at that point, for it may still satisfy a desire, but it becomes surplus consumption or luxury.[2] On any given occasion, then, the proper classification of a particular commodity will depend, in most cases, on how much of it has already been consumed.

Altho it is impossible to discover a difference in kind between necessaries and luxuries, there would seem to

[1] Principles of Economics, chap. vii, § 1.

[2] In some cases continuing to consume a commodity after it has ceased to add to efficiency may have a harmful effect. Of other commodities this can hardly be the case. But this point need not be specially considered in the present essay.

exist a difference in the degree to which different commodities may enter into consumption as necessaries. Some commodities, such as text-books and medicines, satisfy no immediate desires, but are consumed solely for their effect on the consumer in the future. If we confine our attention to sources of immediate gratification, we may distinguish, first, a class of commodities the consumption of even a single unit of which can have no beneficial effect on the consumer as regards his capacity for labor, tho it may satisfy a very intense desire. These are pure luxuries. The generality of commodities constitute a second class. They both satisfy immediate desires, and also have the effect of increasing capacity for labor; tho if successive units are consumed a point will be reached when further consumption would become a pure luxury. There is, however, a third class of commodities which can scarcely be consumed except as necessaries; that is, they cease to satisfy desires at nearly the same point as that at which they cease to add to efficiency. Plain food, coarse clothing, and even small dwelling houses appear to belong to this class of commodities, which may therefore be regarded as including the necessaries of life and the main necessaries for efficiency of an unskilled laborer.

Considering commodities from the standpoint of value, we may reach the same result. If the distinction between desires for present and desires for future gratification be neglected, it may be said that commodities of equal value have about the same marginal utility or capacity to satisfy desires. But their effect on the efficiency of the consumer is very different. Money spent on pure luxuries will add nothing to efficiency. On the other hand, if money be spent on education, properly directed, the amount by which both earning power and social productiveness will be increased is

much greater than the amount so spent.[1] The same applies to the necessaries of life and the necessaries for efficiency of an unskilled laborer. Somewhere between these two extremes the generality of commodities will find a place.

The point has now been reached where the object of the present inquiry may be definitely formulated. Suppose that taxes at a high rate were levied on services or commodities which can add nothing to the industrial capacity of the consumer, and that those which are calculated to augment his capacity by more than their own value were exempted from taxation. And suppose that commodities which lie between these classes were taxed at a varying rate, high or low, according as they are likely to add little or much to the consumer's capacity for labor in proportion to their cost. If taxes on this principle were imposed and maintained for an indefinite length of time, what would be their final effect on the normal rate of interest?

II

It is remarked by Professor Ely that "the demand for necessities is in general less elastic than the demand for luxuries."[2] This proposition may be supported on two separate grounds, whereof the first shows that the first increments of necessaries consumed must satisfy very intense desires; and the second, that subsequent increments will satisfy desires of which the intensity tends rapidly to diminish.

The first ground is as follows. It is obvious that all saving is a sacrifice of the present to the future, for

[1] See the remarks on this point in A Theory of Interest, by C. G. Hoag, pp. 103-; also the definition of luxury in Elementary Principles of Economics, by Ely and ker, p. 120.

[2] Outlines of Economics, p. 164.

while it augments future resources, it diminishes present enjoyment.[1] Let us now examine the converse of this proposition. If every person's income, and also his capacity for enjoyment, were rigidly fixed independently of his own efforts, all expenditure, and therefore all consumption whatsoever, would be a sacrifice of the future to the present. This seems to be strictly true in regard to consumption of luxuries. It is not true, however, of the consumption of necessaries, for expenditure on them is, by definition, offset by an increase in the consumer's capacity for labor, and hence, in his earning power. So far as necessaries at the same time gratify immediate desires, the interests of the present and of the future are, within limits, identical.[2]

If necessaries be held to include such things as medicines and text-books, and the services of physicians and teachers, which satisfy no immediate desires, consumption of this kind must also be reckoned a sacrifice of the present to the future. It is, in fact, a form of saving.

Now, the desire for even the first instalments of necessaries of the latter class may not be very intense. They may be and indeed often are crowded out by luxuries. But the desire for necessaries of the former

[1] This is, of course, strictly true only on the assumption that present wants are infinite. The law of diminishing utility implies that the larger is the income, the smaller is the sacrifice involved in saving a given quantity of resources, so that in the extreme case of the very rich it may be that some saving can be made without any sacrifice of present gratifications. By far the greater part of the savings actually made, however, must involve such a sacrifice.

[2] For a simple but excellent discussion in this connection, from a wider point of view, see Ely and Wicker, Elementary Principles of Economics, 1917, pp. 116–126. Even from the restricted standpoint of the present essay this proposition must be qualified for two reasons. First, capacities which can only be acquired at great expense, in money and effort, may enable their possessor to earn little, and vice versa. There is a tendency, however, for the supply of services the capacity to render which is easily acquired to be great, and therefore for their value to be small, and conversely. Secondly, insofar as capacity for labor is independent of capacity for enjoyment, the labor rendered possible by the increased capacity must actually be performed, if the diminution in present income is to be offset by increased earnings in the future. This difficulty in classification will be referred to below (Part III).

class must be more intense than that for luxuries, for if the latter are not consumed, only the present is sacrificed, but if the former are not consumed, the sacrifice affects both present and future. The necessaries of life are the most striking example of this general class of commodities.

The first ground, then, applies only to one class of necessaries, but the following applies to both. Adam Smith points out that the desire for food is "limited by the narrow capacity of the human stomach." This remark, however, does not apply to food only. It may be laid down generally that, since no one has an infinite capacity for development, no one can have an infinite capacity for consuming necessaries. It has been pointed out that altho any single desire is satiable, the possible kinds of desires are indefinitely numerous, and this variety renders consuming power in the aggregate indefinitely great. But this does not apply to efficiency. If a man is to attain the highest possible development of all his powers during his limited life time, it is essential that he should specialize to some extent. It would certainly be impossible for him to excel in an infinite number of occupations. This, then, constitutes a limitation upon the individual's capacity for consuming necessaries that is not present, to the same degree at least, in the case of consumption of luxuries.

On these combined grounds, we may reach the following conclusion. If the other circumstances affecting the elasticity of demand for commodities, such as available substitutes and different uses,[1] are the same, the demand for necessaries which at the same time satisfy immediate desires must be less elastic than the demand for luxuries, and the demand for other necessaries is unlikely to be more so.

[1] See Pigou, Wealth and Welfare, Part, II, chap. ix, § 5.

In the remainder of this inquiry it will for simplicity be assumed that taxes could be imposed which would reach all luxuries without touching necessaries. The fact that this is nearly impossible does not impair the validity of the theory, but merely limits the extent to which it could be applied.

Writers on the shifting and incidence of taxation appear to agree that a tax on luxuries would raise their price and discourage their consumption. This would take away the occupation of those who had previously been engaged in providing the luxuries. Now, the persons so turned out of employment must work at something for a living. They are not like machines, which will stand idle unless a use is found for them, but possess in themselves the power to find a useful employment, and the strongest motive for adopting that which is most advantageous. It is commonly admitted, also, that the permanent unemployment of large numbers is impossible. The only difficulty is to bring the jobs and the workers together. This problem is never easy of solution, and might be somewhat complicated by the taxes here in view; but if the imposition of the taxes were gradual, the difficulties in this connection would certainly not be insurmountable.

The displaced laborers, then, must work. But what is left for them to work at? They cannot find employment in producing other luxuries, as we must assume that there exist no substitutes which are left untaxed. No doubt many would devote themselves to the production of necessaries, but if the demand for these is less elastic than the demand for luxuries, more persons would be turned out of employment than could be occupied in this way. The only remaining manner in which they can employ themselves is in providing for the wants of the future; that is, in producing capital,

in the form, for example, of improvements in land and labor-saving appliances of all kinds. We may suppose that machines would increase both in number and complexity. Tools for making tools, and for preserving them, would be constructed in endless succession, and greater durability would be imparted to each.[1]

As the consumption of luxuries is supposed to be discouraged, the quantity of capital required for their production, and hence the demand for capital in general, would be, so far, diminished. By far the greater part of the new capital would inevitably be adapted to the production of necessaries. But if such capital were multiplied in this way, the return to the marginal instalment, and hence the rate of interest, would eventually be reduced.

My attention has been drawn to the question whether the marginal productivity of labor would not also be lowered, so that some consideration of the effect of these measures on wages becomes expedient. The increase in the supply of necessaries would evidently reduce their price, and this would lower the cost of living. But most laborers would now be engaged in producing necessaries: would not their wages fall? The answer must be that if capital consists of labor-saving appliances, the increase of capital must increase the physical product of a given expenditure of labor. Therefore, altho the value of a unit of the product of labor would be lowered, money wages need not fall, for the number of units would be increased — and real wages must rise.

[1] In these conclusions the writer is in agreement with Mr. Hartley Withers, Poverty and Waste, chap. ii. He cannot bring himself to accept Professor Kleene's view that "there are limits, perhaps quickly reached, to the productive possibilities of employing additional capital." Profit and Wages, p. 94. Cf. p. 24, footnote. The writer follows Böhm-Bawerk, Positive Theory of Capital, Bk. II, chap. ii. See also John Rae, New Principles of Political Economy, Bk. II, chap. v, and Böhm-Bawerk's excellent summary of Rae's theory, vol. i, pp. 388–391 in the 1900 edition of Capital und Capitalzins; Cassel, The Nature and Necessity of Interest, chap. iii.

The only tendency which could counteract this would be the operation of the law of diminishing returns from land, or materials provided by nature. It must be remembered, however, that the production of luxuries also requires land. It is evident that a consistent and logical application of the taxes here considered would divert land from the production of luxuries and increase the supply available for producing necessaries, including the requisite capital. Therefore, so long as population does not increase unduly, there seem to be no grounds for supposing that the marginal physical productivity of labor would change otherwise than for the better. The inevitable consequence seems to be a rise in the real reward of labor.

This view is confirmed when we consider the source from which wages are paid. The tax on luxuries, in proportion as it diminished the amount of luxuries consumed, would increase the amount saved. This would increase the fund which the business men or *entrepreneurs* in any society are ever seeking to employ profitably by making advances to laborers in exchange for the product of their labor. This fund is identified by Professor Kleene as the classical wages fund, and I am content to accept his description.[1] It must, of course, consist of commodities and services,[2] but there would seem to be no harm in conceiving it to consist of money, inasmuch as these real wages are advanced to laborers by means of a series of exchanges, and must therefore be measured in money.

The fact that the " wages fund " would be increased may be established as follows. " If I have a dollar to spend," writes Professor Carver, "over and above what I need to maintain my working power, I can spend it for

[1] Profit and Wages, chap. viii.

[2] See Taussig, Wages and Capital, particularly the first chapter, and cf. p. 117 et seq.

an article of consumption, or I can spend it for a tool." [1] It may be added that every dollar must eventually be spent in one of these ways; [2] since hoarding, or storage, besides involving a certain amount of risk and trouble, must necessarily be unprofitable as long as any interest whatever could be obtained.

It is further evident that the persons composing any society who are in receipt of a money income more than sufficient to procure necessaries, may be divided into two classes; namely, those who spend the greater part of this surplus income on luxuries, and so save the smaller part of it; and those who save the greater part of the surplus, and so spend the smaller part on luxuries. Everyone who has any surplus income at all must fall into one or other of these two classes, or be on the border line between them.[3]

Now a tax on money income bears equally on both classes. A tax on luxuries, however, would bear mainly on the extravagant class. To persons exactly on the border line it would make no difference how taxes were collected. But if a given sum of money must be raised by the government, and if the parsimonious class contribute little or nothing towards it, it follows that the extravagant class must pay more than they would if the tax had been levied on money income. It is evident that this will increase the aggregate savings of society, for what the extravagant class will lose the frugal class will gain, and the fund referred to above will accumulate in the hands of the latter.

It may be worth while to elaborate this point by means of a simple example. Let us imagine three

[1] Essays in Social Justice, p. 388.

[2] Cf. Pigou, Wealth and Welfare, pp. 440, 441.

[3] If a person has an income only barely sufficient to procure him necessaries, it would even on strictly economic grounds, be inexpedient to attempt to tax him.

brothers, of whom one is frugal to the point of stinginess, another entirely without thought for the future, the remaining one inclining to neither extreme. Suppose they each receive an income of $5000 a year. In the following table, Case I is intended to indicate how their accounts might stand if taxes were levied on money incomes. Case II shows the changes that would take place if all revenues were raised by means of taxes on luxuries.

	Spent on necessaries	Paid to makers of luxuries	Paid to government in taxes	Saved
I. 20 Per cent Tax on Incomes				
A.....	$2,000	...	$1,000	$2,000
B.....	2,000	$1,000	1,000	1,000
C.....	1,000	3,000	1,000	...
Total ...	$5,000	$4,000	$3,000	$3,000
II. 100 Per cent Tax on Luxuries				
A.....	$2,000	...	...	$3,000
B.....	2,000	$1,000	$1,000	1,000
C.....	1,000	2,000	2,000	...
Total ...	$5,000	$3,000	$3,000	$4,000

The change from direct taxes to indirect taxes on luxuries increases the aggregate savings of this imaginary family by a third. The reasoning is equally applicable to an entire nation.

It is also to be noticed that the effect would be cumulative. The increased savings would be added to capital, which in turn would increase the power to save. If we suppose a gradual fall in the rate of interest, this cumulative effect would operate with less force as time went on, but the annual addition would be made to capital even if interest were to vanish entirely.

The aggregate consumption of luxuries must also diminish. For, if extravagant people were content to

spend the same amount as before on luxuries, this sum would buy a smaller quantity of luxuries after they were subject to the tax. If, on the other hand, this class of people insisted on consuming the same quantity of luxuries as before, they would be obliged to pay more for them by the amount of the tax.[1] They could do this, in general, only by trenching on their capital — a course which would lead to their impoverishment, and in the long run to an inevitable reduction in the quantity of luxuries they could procure.

If the impoverishment of extravagant people happened to any great extent, and if the government still required the same amount of revenue, it would be obliged either to raise the rate at which taxes were levied, or to extend their application. On the other hand, if the wealth of the community was increasing, the consumption of luxuries also would tend to increase, notwithstanding the taxes upon them.

It is certain that the larger the income any person receives, the greater will be his temptation to indulge in the consumption of luxuries. It may be that in many cases a person's "effective desire of accumulation" fixes a limit beyond which that person will not carry his savings. It is evident also that the current rate of interest must be among the circumstances which determine this limit. For example if a man feels himself called upon to choose between a fifty-dollar government bond and a champagne supper, the annual yield of the former will certainly be taken into consideration. For present purposes, however, it is not necessary to inquire into the motives which induce men to save, because, whatever they may be, it is certain that they operate

[1] This is an assumption on which the whole argument proceeds. It appears to be roughly true in the long run. During the transition period, of course, the tax would fall partly on the producers of luxuries — a hardship which could be mitigated by a cautious and gradual imposition of these taxes.

with unequal force on different individuals and different families. Out of a given income, some people will spend more than others; and with an increasing income, some people will increase their expenditure more rapidly than others. On the other hand, people who are naturally extravagant must spend less if they are poor than if they are rich. Now the taxes under consideration would constantly tend to throw a larger portion of the resources of society into the hands of people whose " effective desire of accumulation " or " time-preference " is such that they would continue to accumulate when the rate of interest fell far below what is required as an inducement to save by the average member of the community.[1]

By a rigorous system of taxation, unflinchingly enforced for an indefinite period, the government of a country could, without doubt, modify the standards of living of all its inhabitants. The process, however, would be slow, and seems necessarily to involve a reconstruction of the economic strata of which society is composed. The influence of imitation and habit must be taken into account. It is evident that wealth confers power, and that the possessors of wealth must always, to some extent, constitute the leaders of the community, imitated by the other members. If, therefore, such taxes were imposed as would throw most of the wealth into the hands of the thrifty, gradually impoverishing those who are extravagant, the habits and standards of the former would slowly but inevitably impress themselves on the whole people.

If such a drastic policy were adopted in one country only, the tendency would be both facilitated and hastened by the emigration of people with extravagant

[1] My reasoning on this point is suggested by some comments for which I am indebted to Professor Taussig. See his Principles of Economics, chaps. 39–41; also Mill, Principles of Political Economy, Bk. I, chap. xi, and the chapters in Rae there referred to.

tastes, and, possibly, by the immigration of people of the opposite sort, who might be attracted in consequence of the fall in the prices of necessaries and consequent rise in real wages. Indeed, such a policy might tend to cause an increase in the population even apart from immigration, which in turn suggests that the law of diminishing returns might come into operation. This, however, would act more slowly than the other tendencies set in motion by such taxes, and, in any case, would be likely to be counteracted by new discoveries. Nevertheless, it constitutes an influence which cannot be altogether neglected, and suggests that caution would be necessary in taxing luxuries habitually consumed by the lowest orders of the people.

III

The views of the present writer as to the causes determining the normal rate of interest have been outlined in a former article.[1] If that theory is correct, the proposition that a fall in this rate would be the consequence of the tax here considered would seem to be established but for one circumstance: such a tax might cause a diminution in the aggregate amount of labor expended by the whole community, and hence in the magnitude of the annual product. And here it must be admitted, I think, that no absolutely certain prediction can be made, for we have to deal with nothing less complex than the motives which induce men to exert themselves in the acquisition of wealth.[2] There are, however, some circumstances which may tend to allay our fears in this regard.

We must decide exactly what is meant by labor. All consumption involves some kind of activity on the part

[1] Quarterly Journal of Economics, August, 1917.

[2] See Taussig, Inventors and Money Makers, chap. iii.

of the consumer. " All sound, sight, taste, smell, touch, come about through reactions of the nervous system to external stimuli." [1] But surely these reactions are not labor. The consumption of some commodities demands conscious effort; and in some cases, where the benefit looked for is a future one, the effort is disagreeable. It does not, however, seem necessary to classify as labor any of these activities. For present purposes, exertions — disagreeable or otherwise — which are incidental to the consumption of any commodity or service, whether necessary or luxury, will not be regarded as labor. Since necessaries are supposed to include all objective factors which contribute to the creation of " personal capital " it follows that labor will not include the subjective efforts which a person expends for the same purpose, such as reading text-books or studying under a teacher.[2] But writing text-books, imparting knowledge or skill, and generally *rendering* services to others, either directly or indirectly, must be classed as labor. Similarly, efforts which a person makes with no other object than the immediate gratification of his desires — playing games for example — are not labor.[3] On the other hand if the sole object of the efforts is to gratify the immediate desires of other persons, they must fall into the same category as the exertions of teachers. Yet we must not exclude from our conception the efforts which a man expends, say, in building a house for his own future use. It seems, therefore, that labor might be defined as any exertion which a person puts forth for the purpose of creating a utility

[1] Fisher, The Nature of Capital and Income, chap. x, § 2.

[2] For this reason I hesitate to follow Professor Fetter when he seems to regard " taking medicine " as labor; Economic Principles, chap. xvi, § 5.

[3] Cf. Jevons, Theory of Political Economy, p. 168 in edition of 1911. The conception of " opportunity costs " (see Davenport, Economics of Enterprise, chap. vi) appears to make it unnecessary to regard labor as painful.

capable of being consumed by someone else.[1] This seems in accordance with a very common conception which regards labor as having to do with the earning or saving of money, or wages.

Of the exertions which men put forth to provide for their own consumption, some are in the social sense productive of utility, and some are merely predatory.[2] It seems advisable, however, to simplify the present discussion by assuming that all labor belongs to the former category. It is evident that anything that an individual may gain by an activity which contributes nothing to the national dividend must be offset by a loss on the part of someone else. But, in the words of Professor Taussig, "it is the aim of the legal system under which we live — the system of private property — to inhibit predatory doings."[3] Therefore in the above hypothesis we merely assume that the law accomplishes its object.

Now, if leisure be defined as all time not devoted to labor, including time spent in acquiring capacity for labor, it would seem that leisure can be classified, like all other sources of enjoyment or benefit, as either necessary or superfluous.

The introduction of the element of time reminds us that human life is limited, and it is convenient to take account of that circumstance in applying our classification in this instance. It is evident that some leisure is necessary for mere existence. Some of the examples that have been cited — by Marx for example — would lead one to think this minimum astonishingly small. If, however, only this barest minimum is allowed, no time is left to the worker for education, and the quantity of

[1] This and other parts of the present essay are the outcome of some valuable criticisms of which my work has had the benefit.

[2] See Taussig, Principles of Economics, chap. ii.

[3] Loc. cit., § 5.

work which he can accomplish during his lifetime must, owing to his inefficiency, be very much smaller than would be the case if his hours had been shorter. On the other hand, if a person spends more than a certain amount of time in repose, or in the pursuit of pleasure, or even in the attainment of skill and knowledge which he will be unable either directly or indirectly to apply, in this case also the total quantity of labor he will perform will be less than it might have been. Necessary leisure, then, may be defined as that which a man must allow himself if he is to perform during his lifetime the maximum amount of labor of which he is capable. All leisure in excess of this may be classed as superfluous.[1]

Now the annual product is affected by the amount of time devoted to labor, and also by the efficiency of labor. And the circumstances affecting efficiency seem capable of classification under two heads: first, the capacity for labor which a people possesses, and secondly, the intensity with which their labor is applied. But capacity for labor is affected by the amount of necessaries consumed, and among necessaries in this connection must be included a certain amount of leisure. In this category must be placed the time required for education or training, and for any given person or group of persons, at least up to a certain point, this must be the more prolonged, the higher is the pitch to which their faculties are to be developed. Also it may be assumed that intense labor is more exhausting than that which is not intense, from which circumstance we may conclude that the more intensely people exert themselves, the more rest they will require in order to

[1] The definition of necessary consumption in the first part of this essay had reference only to the *capacity for* labor. But if the conception be extended to include leisure as above defined, this will exclude from that category any capacity for labor which will not actually result in a corresponding increase in production, since it may be presumed that all capacity for labor takes time to acquire.

prevent their capacity for labor in the future from being impaired. On these combined grounds it may be laid down that the amount of time which must be regarded as necessary leisure varies with the efficiency of labor.

It follows from the above definitions that the amount of time devoted to labor varies inversely as the amount of leisure which people allow themselves. Altho, therefore, part of this leisure is a condition of efficient labor, we may yet say that the annual product tends to vary inversely with the amount of superfluous leisure enjoyed.[1]

Now, it may be urged, if we make the supposition that, in a general way, the elasticity of the demand of consumers for all superfluities is greater than unity; and if all commodities and services which can be consumed as superfluities are taxed, superfluous leisure alone remaining untaxed, will not this induce people to substitute the latter for the former, and hence to perform less labor? I suppose this must be admitted to be possible. On the other hand if the elasticity of the demand for superfluities in general is less than unity, a rise in the price of luxuries would tend to make people work harder. Here habit, by making demand more insistent, would tell in favor of action.

Again, how far is it true that superfluous leisure would remain untaxed? Luxuries are for the most part enjoyed during periods of leisure, so that by discouraging them the government would be making leisure less attractive, which would so far tend to make labor more so.

It may be that some people would restrict their consumption of necessaries for the sake of continuing their usual enjoyments, which would injuriously affect their capacity for labor. The opposite effect is also possible,

[1] The reasoning in the remainder of this essay is due to suggestions for which I must acknowledge my obligation to Professor Taussig.

as may be shown by the following example. A hungry workman enters a restaurant and is confronted by a choice of two kinds of food, of which one is nutritious but unpalatable, and the other is tempting but affords little nourishment. It is evident that if the price of the latter were enhanced by a tax so as to be beyond his reach, he would eat the more wholesome food rather than go hungry. The effects of this are different according to how far he looks ahead. For short periods the gain in efficiency would be insignificant, and the loss of enjoyment considerable; but if the change in his consumption were maintained for a period of decades, his loss of enjoyment would be negligible and his gain in efficiency appreciable. If this example could be supposed to illustrate a general tendency, people might enjoy more leisure, even superfluous leisure, and yet not in effect perform less labor.

It was argued above that the taxes here treated of would, in reducing interest, also raise wages. If these contentions be correct, the proximate effect of such taxes — that is, after the requisite adjustment of industry had taken place — would be to bring the necessaries for efficiency within the reach of all. Ultimately the rise of wages might check the fall in the rate of interest by making a living so easy to obtain that men of moderate desires would cease to have a motive for strenuous exertion. On the other hand, if it could be established that the mere increase in private savings could bring about a result so desirable — if the dictates of altruism and far-sighted selfishness could be shown to be so nearly identical — many who became convinced that this was the case would be likely to make the accumulation of wealth the supreme object of their lives, and no assignable bounds could be set to the savings which might be made.

Further speculations along these lines would lead us away from the sober reasoning proper to economic science. It must be remembered that a hasty and incautious interference with the normal course of trade would, temporarily at least, cause the loss of much fixed capital and specialized skill; and if the policy ran counter to public opinion it would lead not only to evasion but to discontent and idleness as well. On the whole, however, taking a broad view of the subject, there seem to be grounds for concluding that, if the revenues of the government were collected as far as possible by means of taxes on services and commodities which are likely to add little to the consumer's capacity for labor in proportion to their cost, this would ultimately tend both to increase the supply of capital and to lessen the demand, which might confidently be expected to result in a fall in the normal rate of interest. It may be added that this would so far constitute an approach to those ideal conditions under which the workman would receive the whole produce of his own labor.

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WAR LABOR POLICIES AND THEIR OUTCOME IN PEACE

SUMMARY

Earlier resort to leaders of unions in American Federation of Labor, 2. — Compulsory arbitration not tried, 324. — The War Labor oard, 326. — Its principles, 328. — Shop Committees, 329. — The ailroad Administration's labor policy, 330. — The Wage Commission 1918, 332. — The permanent Board of Wages, and other adjustment ards, 332. — Local shop committees, 334. — General aspects of the ar developments, 336. — The three types of labor adjustment, 336. — he Federal Employment Service, 338. — Its development to the date the armistice and its future, 340. — Conclusion, 342.

In the issues of this Journal for November, 1917, and ebruary, 1918, an account was given of the various ıethods which had been resorted to by the govern- ıent for adjusting labor problems in war industries. he object of the present paper is to describe briefly ıe further developments which occurred during the last n months of the war, and to consider these develop- ıents with reference to their bearing on labor problems nd policies in time of peace.

A main theme in these earlier articles was that in rder to accomplish any approximate stabilization of ar labor conditions without compulsory arbitration, he government should control all contractors in war ıdustry through provisions in the contracts limiting the ontractors, under heavy penalty, to the payment of ıaximum scales of wages, these scales to be changed om time to time uniformly in any given industry by overnmental adjustment boards, on which represen- ıtives of labor would sit. But it was pointed out that

the government could, by exercising its war power, effect this arrangement through recalling and modifying its outstanding contracts, and also its sub-contracts. Under the conditions of increasing labor shortage after February, 1918, the control most needed continued to be not that of the workers, but that of employers engaged in war industry. Such control did not emerge, either through government contracts or otherwise. The contractors continued to bid against each other for the labor supply, and an unrest developed among the workmen which seriously interfered with efficiency in production, and would doubtless have badly hampered war industry but for the motives of patriotism in all ranks of labor, organized and unorganized. It must be confessed that the national leaders of the American Federation of Labor did not in general exercise sufficient influence during those months to control their local unions in the disturbing conditions caused by the mounting competition of employers for the available labor.

Just why the influence of the national leaders in the American Federation of Labor did not prove more effective in dealing with the situation is not altogether clear; yet some of the reasons are evident. During 1917 the national union leaders had voluntarily undertaken great obligations and responsibilities by entering into written agreements with the government in which they pledged themselves and their organizations to a war-time production uninterrupted by strikes, and to the adjustment of labor disputes by representative arbitration which would be binding and final. In cantonment construction, in shipbuilding, and in general at the seaports, these written agreements forced the union leaders to assume such a vigorous leadership as greatly to increase their influence. Personal responsibility begets effort.

The particularist tendencies in unionism were checked, and the constituent national and international unions became centralized as never before in the Washington office of the American Federation of Labor.

It was intended that this method of adjustment should be extended from cantonments, shipbuilding, and the ports, over all war industry, together with the necessary concomitant of that method, namely, the control of contractors through maximum wage scales in the contracts. A preliminary memorandum, looking to an adjustment arrangement covering all munitions and supplies production, was tentatively signed by a number of union leaders in November, 1917. It is not unreasonable to believe that such a system, if carried out, would have led to a fairly satisfactory stabilization of labor. To the written pledge of the few union leaders involved in the earlier agreements, would have been added the written pledge of the many leaders whose members were interested in munitions and supplies production. But this form of contract control did not develop. Nor did the arrangements for a comprehensive adjustment board, based upon official pledges of all the national presidents with jurisdiction over production of all munitions and supplies, ever progress beyond the preliminary stage. Both of these projects encountered the baffling obstacles presented by government departments which were themselves bidding against each other for labor supply, and whose representatives could not agree upon a common course.

It was at this juncture that the current of labor adjustment in war industry became diverted into a new channel. In the new fields of war industry the international presidents did not become personally pledged in writing to agreements against strikes by members of their respective unions and to arrangements for adjust-

ment. This feature was absent in the National War Labor Board and in the Railroad Administration's system of labor control, both of which we shall examine directly. Thus was arrested a distinctive process of strengthening and centralizing the influence of the American Federation of Labor. Whether these leaders, if they had been so pledged, could have succeeded in such a great task of control and coöperation is a question which can never be answered. One thing is certain: that through this divergence from the method of labor adjustment which had obtained earlier in the war, the American Federation of Labor in the later months of the war lost the further development of that element of strength which came from the necessity of meeting these written pledges.

It will always be an interesting query whether, if the war had continued for a considerably longer period, some form of compulsion would have been adopted by the government. It is true that in the latter part of the year 1918 the strikes in Great Britain showed that compulsory arbitration does not always compel. But there were during the last months of the war signs that part of general public opinion in this country was beginning to favor some form of official duress, and that many of the union leaders, feeling their own control inadequate, would not have been opposed to such a course. In the middle of August, 1918, an attempt to make participation in a labor strike ground for a draft registrant's losing the benefit of his deferred classification was defeated in Congress. But only a month later, on September 13, the President in his handling of the Bridgeport strike invoked what was in effect governmental compulsion. The War Labor Board, having been unable to agree upon a decision with reference to the machinists' complaints at Bridgeport, had unan-

imously agreed upon an umpire to decide the questions at issue. The machinists, through the Bridgeport locals, had submitted their dispute to the umpire for arbitration; and the local organization, District Lodge No. 55, was now refusing to accept his award. The President, in an open letter addressed directly to the lodge, reviewed the situation briefly and closed with the following paragraph:

> Therefore, I desire that you return to work and abide by the award. If you refuse, each of you will be barred from employment in any war industry in the community in which the strike occurs for a period of one year. During that time the United States Employment Service will decline to obtain employment for you in any war industry elsewhere within the United States, as well as under the War and Navy Departments, the Shipping Board, the Railroad Administration, and all other government agencies, and the draft boards will be instructed to reject any claim of exemption based on your alleged usefulness in war production.

A few days after the letter was published, the strikers at Bridgeport returned to work. A striker with that letter staring him in the face was practically under governmental compulsion. And yet neither in the issue of the American Federation's weekly news letter following the affair, nor in the October issue of the *Federationist*, nor in the subsequent issue of the machinists' official organ, the *Machinists' Monthly Journal*, was the President's course adversely criticized.

The indication of the whole trend of events seems to be that the national leaders in the American Federation in the latter part of 1918 were losing rather than strengthening their hold upon the local unions. The public on the other hand was reaching the conclusion, largely shared by many national labor leaders, that wages in war industries had advanced sufficiently to satisfy just demands; and that in view of the adjustments which could be expected from the War Labor

Board, interruptions to war industry by strikes were intolerable. Under such circumstances some sort of system for compulsory settlement of war labor disputes might have developed in America if the war had continued through 1919.

Two important labor adjustment agencies came into existence during the final ten months of the war — the National War Labor Board and the Railroad Administration's system for determining wages and conditions. In neither of them did the pledge of the international presidents to continuous production by the members of their respective unions appear as the foundation of control.

The President created the War Labor Board by proclamation on April 8, 1918. In February the Secretary of Labor had requested the managing directors of the National Industrial Conference Board, an employers' organization, to name five representatives of employers, and had also requested the President of the American Federation of Labor to name five representatives of labor; these ten men were to compose the War Labor Conference Board, which was to make recommendations for some system of labor adjustment and administration. The Board thus formed was augmented by Ex-President Taft, chosen to act as counsel for the employer group, and by Mr. Frank P. Walsh, formerly Chairman of the Federal Commission on Industrial Relations, acting similarly as counsel for the employee group. On March 29, 1918, this Board made to the Secretary of Labor its recommendation that there be established immediately a National War Labor Board of the same number and selected by the same agencies, "to promote and carry on mediation and adjustment in the field of production necessary for the effective conduct

of the War," except " where there is by agreement or by Federal law a means of settlement which has not been invoked." This recommendation was accompanied by a statement of principles (to be examined presently) agreed to unanimously by the Conference Board. On April 8, 1918, the President issued his proclamation formally establishing the War Labor Board.

On this new agency for labor control were five representatives of the American Federation of Labor, of whom two were international presidents, sitting in joint control of labor standards. Among the principles announced by the Conference Board in its report of March 29, was the statement: " There should be no strikes or lockouts during the war," — a principle to which the labor members of the National War Labor Board must be held to have committed themselves when they accepted appointment under the President's proclamation. But Mr. Johnston's adhesion to this principle as a " representative of labor " on the Board was very different from the same man's direct written pledge in the shipbuilding agreement, in his capacity as president of the International Association of Machinists, that disputes " shall " be submitted to an adjustment board and that " the decision of the board will, in so far as this memorandum may be capable of achieving such result, be final and binding upon all parties." It will be remembered how in October, 1917, several international presidents in the metal trades, bound by this written pledge, went on their own initiative to the Pacific coast, and, pitting their strength against a group of local union leaders, forced the return to work of employees in the shipyards at Seattle pending a consideration of their dispute by the Shipbuilding Labor Adjustment Board. If the national union leaders had been behind the National War Labor Board with similar pledges the

drastic action by the President in the Bridgeport case probably would never have been necessary.

But the National War Labor Board, altho it did not undertake through the medium of specific pledges, to strengthen the group of international presidents as an agency for control, did operate to strengthen immeasurably the general position of unionism in America. The President in his proclamation of April 8, 1918, declared that the War Labor Board was to observe the principles specified in the report of the War Labor Conference Board. Among the principles laid down in the Conference Board's report and thus made by the President's proclamation a basis for the work of the War Labor Board, were the following:

1. The right of the workers to organize in trade-unions and to bargain collectively through chosen representatives is recognized and affirmed. This right shall not be denied, abridged, or interfered with by the employers in any manner whatsoever.

2. The right of employers to organize in associations of groups and to bargain collectively through chosen representatives is recognized and affirmed. This right shall not be denied, abridged, or interfered with by the workers in any manner whatsoever.

3. Employers should not discharge workers for membership in trade-unions, nor for legitimate trade-union activities.

4. The workers in the exercise of their right to organize shall not use coercive measures of any kind to induce persons to join their organizations, nor to induce employers to bargain or deal therewith.

. . . . . .

1. In establishments where the union shop exists the same shall continue and the union standards as to wages, hours of labor, and other conditions of employment shall be maintained.

2. In establishments where union and nonunion men and women now work together, and the employer meets only with employees or representatives engaged in said establishments, the continuance of such condition shall not be deemed a grievance. This declaration, however, is not intended in any manner to deny the right or discourage the practice of the formation of labor unions, or the joining of the same by the workers in said establishments, as guaranteed in the last paragraph, nor to prevent the War Labor Board from urging, or any umpire from granting, under the machinery herein provided,

provement of their situation in the matter of wages, hours of bor, or other conditions, as shall be found desirable from time to me.[1]

Two ideas, namely, the right of workers to organize, nd the shop committee idea, i. e., the meeting of em- loyers with committees of the workers, were carried ut in far-reaching ways during the few months of the Var Labor Board's activity. As regards the recognition f the unions, the Board continuously refused to require n employer to enter into a contract with a union, as uch, except in instances when a union contract had een in force prior to the submission of the controversy. he right of workmen to organize was sustained repeat- dly. On August 1, in the Columbus Street Railway djustment, the Board upheld the right of employees o display the union button; it frequently ordered the einstatement of men discharged for union activities; it epeatedly discountenanced the individual restrictive ontract with employees, and instead expressed itself in avor of the collective agreement.

The shop committee was promoted by the War Labor oard at every opportunity as the proper agency for ollective bargaining. In some cases the form of this romotion did not go further than the bare finding that he employers must deal with committees of the work- nen. In other cases the Board went so far as to pre- cribe the way in which the committees of the workers hould be selected, as for instance in the following:

10. Election of Committees.

The election by the workers of their representative department ommittees to present grievances and mediate with the company shall e held, during the life of this award, in some convenient public build- g in the neighborhood of the plant, to be selected by the examiner f this board assigned to supervise the execution of this award, or, in he case of his absence, by some impartial person, a resident of

[1] Monthly Review, U. S. Bureau of Labor Statistics, May, 1918, pp. 56, 57.

Pittsfield, to be selected by such examiner. Such examiner, or his substitute, shall preside over the first and all subsequent elections during the life of this award, and have the power to make the proper regulations to secure absolute fairness.

In the elections the examiner shall provide, wherever practicable, for the minority representation by limiting the right of each voter to a vote for less than the total number of the committee to be selected. Elections shall be held annually.[1]

This sketch may suffice to indicate the scope of the War Labor Board and the nature of its work. As a force for industrial peace and continuity of production in war, it played a notable part. Unquestionably such restraining influence as it was able to exert was due in the main to the spirit both of employers and employees during the national emergency. What use can be made in the coming period of its basic principles and of its technique is a question. The extent to which labor groups are willing to be controlled in their collective bargaining will in the last analysis determine the issue. Possibly they will agree to governmental control when its exercise is vested partly in their own national representatives. The shipbuilding type of labor adjustment, based on the pledge of the leaders of the national unions, gives promise of being used in peace time. In it lie perhaps the germs both of a sound democratization of labor control and of a conscious collective responsibility of labor to the community at large. But this, as well as the War Labor Board's work itself, is mainly educational. Both have broken down some of the barriers between management and labor.

The other important adjustment machinery developed by the government during the last ten months of the war, namely, that in the Railroad Administration, is of considerable magnitude. As distinguished

[1] Findings of joint chairmen as arbitrators in re Employees v. General Electric Co., Pittsfield Works, July 31, 1918.

from the somewhat more fortuitous machinery of the War Labor Board, it was planned in advance with great thoroness. The outstanding features of the labor administration of the railroads are, first, the laying of a foundation of standard wages and working conditions in advance by a board composed exclusively of government appointees, not one of whom was a representative of labor; second, the omission of mention, in the basic documents, of a union or a union standard, altho the system for further standardization and for adjustments in individual cases is largely dependent upon the action of persons selected from among the unions for service as officials; and third, the right of appeal to the Director General, from the decisions of the boards whose function it is to change the basic standards and to interpret and apply them. These boards are made up equally of representatives of capital and labor, and their decisions must in any event be approved by the Director General; they are thus reduced to the status of agencies merely advisory.

Altho the standards thus established and the scope allowed to the unions have greatly improved the relations between labor and management, the arrangements leave labor no final voice in the determination of standards. As compared with the War Labor Board, the labor adjustment system in the Railroad Administration, from the point of view of institutional development, is distinctly conservative.

So much by way of general analysis. The steps taken in creating this important system of railroad labor adjustment were in detail as follows. At the very outset of his administration, the Director General had averted certain threatened strikes by entering into preliminary arrangements with union leaders.[1] On January 19,

[1] See this Journal for February, 1918, p. 362.

1918, a few days later, he appointed a Railroad Wage Commission, of four men — Secretary Lane of the Department of the Interior, Charles C. McChord of the Interstate Commerce Commission, J. Harry Covington, Chief Justice of the Supreme Court of the District of Columbia, and William R. Wilcox, of New York. The Commission was directed to " make a general investigation of the compensation of persons in the railroad service, the relation of railroad wages to wages in other industries, the conditions respecting wages in different parts of the country, the special emergency respecting wages which exists at this time owing to war conditions and the high cost of living, as well as the relation between different classes of railroad labor." On April 30, 1918, this Commission made its report. It took account of all railroad employees, whether manual or clerical, receiving less than $3000 per annum. It found that " the man who received $85 a month on January 1, 1916, now needs 40 per cent additional to his wage to give him the same living that he had then." It recommended a detailed sliding scale of increases, under which, for instance, an employee receiving $50 per month would receive an increase of $21.60; a $150 per month employee, an increase of $24.25; and a $245 per month employee, an increase of $5.00.

On May 25, 1918, the Director General of Railroads adopted in the main this sliding scale basis of increase as recommended by the Wage Commission and at the same time established the Board of Railroad Wages and Working Conditions, naming its six members, three of whom are railroad officials and three trade union officials. This Board was to investigate inequalities effected by the new scale, competition with employees in other industries, and rules and working conditions. By the terms of the order creating it, it was to be solely

an advisory body and was to submit its recommendations to the Director General for his determination. Its activity has consisted largely in making decisions on interpretations of the orders and rulings of the Railroad Administration respecting labor.

In addition to this general board, other agencies have been set up for the several groups of employees. Three separate boards of adjustment have been established, each composed of eight members, of whom four are designated by the railroad managements and four by the unions interested in the jurisdiction of such board. Board No. 1 has to do with " train service employees," such as engineers, firemen, conductors, trainmen, switchmen — employments covered by the " Big Four," or Railroad Brotherhoods. Board No. 2's jurisdiction is over the railroad shops — employments covered by the " Mechanical Department of the Railway Employees Department " of the American Federation of Labor. Board No. 3 is concerned with telegraphers and maintenance-of-way clerical and station employees. To a fourth board are left on appeal such local disputes as do not come up through channels of organized labor. It consists of the two assistant directors of the Division of Labor — the first for a number of years a government officer as a member of the United States Board of Mediation and Conciliation, the second until recently a president of one of the metal trades international unions. Finally, grievances of women workers follow a fifth course, being handled directly by the Director of the Division of Labor.

Besides having for their bases in general a wage scale increase determined upon by the Wage Commission, Adjustment Boards Nos. 1, 2 and 3 have for their guidance certain direct agreements between the Railroad Administration and union officials. Thus on March 22,

1918, the three regional directors entered into a written agreement with the chiefs of the four Brotherhoods (the "Big Four") that the wages and hours as determined by the Director General were to be incorporated into existing wage agreements between the railroads and the Brotherhoods; and that "matters of controversies arising from interpretations of wage agreements shall be decided by the Railway Board of Adjustment." Adjustment Board No. 2, with jurisdiction over grievances of the "Railroad Shopmen" of the American Federation of Labor, was, like Adjustment Board No. 1, arranged for before the standardization of wages by the Wage Commission had been announced. On February 20 the Director General and this union group, through its president, entered into an agreement under which, irrespective of existing agreements to the contrary, relaxation might be effected in working hours in cases of necessity, and also changes in the conditions under which the ratio of helpers and apprentices to journeymen might be increased. Up to the present time Board No. 1 has decided about 400 cases, Board No. 2 about 100, and Board No. 3, established in the middle of November, only a few.

But probably the most important contribution of the Railroad Administration's labor adjustment system has been its successful promotion of local shop committees. The March 22 agreement with the Brotherhoods contained the following provision about the handling of grievances:

10. Personal grievances or controversies arising under interpretation of wage agreements, and all other disputes arising between officials of a railroad and its employees, covered by this understanding, will be handled in their usual manner by general committees of the employees up to and including the chief operating officer of the railroad (or some one officially designated by him), when, if an agreement is not reached, the chairman of the general committee of

employees may refer the matter to the chief executive officer of the organization concerned, and if the contention of the employees' committee is approved by such executive officer, then the chief operating officer of the railroad and the chief executive officer of the organization concerned shall refer the matter, with all supporting papers, to the Director of the Division of Labor of the United States Railroad Administration, who will in turn present the case to the Railway Board of Adjustment No. 1, which board shall promptly hear and decide the case, giving due notice to the chief operating officer of the railroad interested and to the chief executive officer of the organization concerned of the time set for hearing.

11. No matter will be considered by the Railway Board of Adjustment No. 1, unless officially referred to it in the manner herein prescribed.

12. In hearings before the Railway Board of Adjustment No. 1, in matters properly submitted for its consideration, the railroad shall be represented by such person or persons as may be designated by the chief operating officer, and the employees shall be represented by such person or persons as may be designated by the chief executive officer of the organization concerned. (U. S. Railroad Administration, General Order No. 13.)

Substantially similar rules govern all appeals for adjustment by the adjustment boards. Bona fide resort to shop committee procedure is required before the assistance of the Director of the Division of Labor can be invoked. The result has been that the vast majority of grievances never reach him, and that local railroad management and local railroad labor over the country are becoming to an increasing degree habituated to frank, thoro discussion of grievances and to their equitable and amicable adjustment.

As might be expected, the exercise by the railway unions, both manual and clerical, of these important advisory functions in railroad labor policies has greatly increased their membership and influence. Railroads upon which unionism had never obtained a real foothold prior to 1918 have seen the establishment of unions or their great increase. This has been particularly true of the railroad shopmen and of the clerks.

In any endeavor to appraise the developments in labor adjustment during the war for their effect upon after-war conditions, we are confronted with so many variables, both political and industrial, that no estimate can be made with assurance. But we may take the features of control in the order of their apparent chances of survival. The local shop committee has been planted so well and so broadly throughout industry by these various governmental adjustment agencies as hardly to seem eradicable. Promoted from the outset by the Shipbuilding Labor Adjustment Board, later by the President's Mediation Commission in the Arizona Copper district, and in the packing establishments, firmly established subsequently by the War Labor Board in widely divergent fields of industrial activity which had never known its use, and finally made a thoroly integrated part of a machinery for adjustment extending over the entire American railroad system, the shop committee has secured a strong position. And it has on the whole been accepted by organized labor with willingness. Is it not likely to prove a permanent element, fixed in American industrial life by the events of the war?[1] Whatever reaction is to be expected toward pre-war industrial relations could hardly sweep away a method so widely employed and in essence so akin to the genius of American institutions.

But as regards final appeal in disputes, and restraint during and after adjudication — how will these develop after the war? Of the three principal new types of machinery which were evolved during the war, only one was designed both to handle disputes and to supply with some effectiveness the element of restraint in the use of

[1] A significant indication is the establishment on January 7, 1919 of a thorogoing system of shop councils, with a joint board of appeal, by agreement between the Bethlehem Shipbuilding Corporation and the Metal Trades' Department of the American Federation of Labor.

the strike, namely, the Shipbuilding Labor Adjustment Board type. Here the chief union representatives agreed, each for his union, that production would be continuous, both during and after adjudication. But the motives which made this arrangement possible have no equivalent which is apparent at this time and which would induce the unions to bargain away their chief weapon, the strike. And yet, if they should be given an equal voice with the employer in the determination of labor standards, it cannot be said that some such political-industrial arrangement is impossible.

As regards the establishment of quasi-judicial machinery for wage determination, the three types which emerged under war conditions varied in important particulars. The three types are the War Labor Board, the shipbuilding arrangement, and the railroad adjustment system. In the first two, management and labor both placed the settlement of their disputes in the hands of a board on which the opposing interests were equally represented. In the War Labor Board no method was devised for breaking a deadlock between the two sets of representatives; they were forced to reach some sort of settlement, and the advantage naturally tended to remain with the labor group, which retained its right to strike. In the shipbuilding type, on the other hand, a supposedly neutral member, appointed by the government, cast the deciding vote. Finally, in the railroad adjustment system, disputes were left to a board again constituted of an equal number of representatives from both sides, but established directly by the railroad management itself; the railroad management moreover reserved and continues to reserve final decision for itself; it has in its own hands the control of labor standards. In any event we may expect the wage board of the future to be more independent of the management

than is the Railroad Administration type today. As between the balanced board and the board in which a neutral member turns the scale, the issue might perhaps come to depend upon the political strength of labor, if the government should continue to promote adjustment of industrial disputes.

Quite a different development, as to after-war survival, is that of the Federal Employment Service. As a federal agency for stabilizing employment for labor it is evidently marked for survival in some form. The final establishment of this work has not been by means of executive action or by semi-official emergency agreements, but through the firm basis of statute.

The statute of 1913 creating the Department of Labor set forth the activities in which it could engage — immigration and naturalization, labor statistics, and mediation. There was no mention of labor exchange work, despite the fact that unemployment was then a pressing problem and that a number of the states, following European example, were establishing state employment agencies. Doubtless one reason for this omission was the uncertainty of legal justification which must be faced by any federal activity, other than transportation, which undertakes to operate within a state. Obviously, an employment office operating at a given point could hardly limit itself to interstate operations by placing applicants in positions in other states only.

Unemployment relief, however, made its own way into the Department of Labor without the aid of Congress. During the three years preceding 1917, the Secretary of Labor made the Bureau of Immigration the vehicle for an employment service which established offices at a number of points and gave useful service, operating generally apart from the state and municipal

agencies. The entrance of the United States into the war, however, and the consequent serious problems of labor supply, brought the local and federal agencies together, especially after October 6, 1917, when Congress for the first time recognized this extra-legal work of the Department, and impliedly sanctioned it, by appropriating $250,000 for its prosecution. The President out of his own emergency fund allotted the further sum of $825,000.

It was high time for Congress to take a hand in the labor exchange situation. Two disturbing factors particularly called for general direction and management, free from private and local interest. Out of the unprecedented scramble for unskilled labor had emerged the phenomenon of state laws which prohibited the employing of persons in one state to work in another. Altho laws of this form were clearly unconstitutional and were eventually held to be so, they were not without effect, and occasionally prevented the natural flow of labor to the points where it was most needed. The prosecutions, the summary exercise of local authority, and the violent activity at various points, especially in the South, directed toward preventing the departure of negro laborers, would make an interesting chapter in American war labor history. The other element contributing to the confusion was the private employment agency. The pernicious practices often attendant on this business had largely influenced the establishment of the public agencies, and also the enactment of the embargo laws on the exportation of labor. In the state of Washington a few years ago a law was enacted designed to bring about the extinction of such agencies. Tho held unconstitutional by a divided United States Supreme Court, the terms of the decision were such as probably to leave the way open for state laws which

would effect the same purpose. The private agencies by their irresponsible methods of advertisement and solicitation became, as the war progressed into 1918, an increasing source of disturbance.

On March 28, 1918, following up its action in the preceding October, Congress appropriated $250,000 " to enable the Secretary of Labor to advance to wage earners transportation to such places as may be deemed necessary for the purpose of securing employment in connection with the prosecution of the war," and on July 1, 1918, took the decisive step of appropriating five and a half million dollars to be available for employment service. With such support, and with the urgency of the labor supply problem, the United States Employment Service — with its multitudinous employment offices at principal industrial points; its supplementary recruiting arm, the Public Service Reserve, reaching out into smaller communities; its Farm Service Division; its Women's Division; and its Boys' Working Reserve — had by the autumn of 1918 built up a huge if cumbrous machine and had materially assisted in the adjustment of the labor supply.

The position of the Employment Service was much strengthened when the President on June 17, 1918, issued a proclamation, in which he called upon employers over the country, engaged in war work, not to recruit unskilled labor through any private agency but, beginning with August 1, to rely upon the federal service. A great effort was begun to organize the service up to taking on this responsibility, offices being established in great numbers. At the same time the War Labor Policies Board, a council in the Department of Labor composed of representatives of the various federal war agencies, planned the geographical distribution of industrial committees all over the country,

nd the creation for each community of a labor board. hese community labor boards were to be boards of hree, the chairman being the local representative of the mployment Service, and his associates selected one by he employers, and one either by the organized workers of the community, or in the absence of an organization by unorganized workers. Each board was to work under the general direction of the Public Service Reserve director for the state, in recruiting and distributing labor in each community. The principal objects behind this plan were first that the needs of the great war industries for common labor should be met by drawing to a considerable extent upon the less essential and non-essential industries, and second that through a central machinery, run without the motive of private interest, placements of men could be made with sufficient care to fitness to cut down the mounting index of labor " turnover." Altho the plan was based entirely upon voluntary appeal, it effected at once a considerable decline in the use of newspaper advertising and of private agencies in recruiting labor, and had good results in the number of laborers obtained.

Altho the plan was never extended to skilled labor, the larger newspapers and industries of the country cooperated with the Employment Service by referring all applicants answering their advertisements to the United States Employment Service and by not advertising their wage rates publicly as inducements. But the activities of the private agencies and of the recruiting managers of large plants continued with no abatement, and with them the progressive, almost furious, contest in competing wage rates.

Such was the Employment Service in November, when the news of the armistice descended upon America. This agency, in its infancy in the spring of 1917, with

no real legal status or financial support, had become eighteen months later the great official labor supply agency of the country. The state employment services, even those which had attained some degree of stability and usefulness, had lost, temporarily at least, their influence.

What will be the future of this branch of federal service? It would seem that nothing short of an incredible reaction toward decentralization could push the Department of Labor back to its old position. It will be remembered that the American Association for Labor Legislation in the winter of 1917–18 was promoting a bill to bring about a partnership between the federal government and the states in the operation of employment changes. Another bill of similar nature is now proposed or pending. But the idea of exclusively federal activity in this field has in the meantime gained such momentum, that the new bill will have to meet the attacks both from the believers in unhampered state powers and from the reinforced adherents of exclusive federal control. Whatever the outcome, it will certainly bring with it the establishment of an important labor exchange function in the Department of Labor. And it would seem safe to predict that the federal government's work in this service will in the next decade become progressively of more importance.

The contrivances for labor control and adjustment discussed in this paper and the two preceding are the outstanding labor developments of the war. They grew in the main spontaneously, separately, without emanating from any central plan. Most of them were late in being created. The government contracts were never so administered as to make possible any real steadying of the labor situation. Had it not been for real faith among

the workmen in the President's sincere and wise concern for their welfare, and for the patriotism which checked class issues as the war progressed, the success of the several arrangements would have doubtless been far less than it was. What might have happened during another year of war is mere matter for speculation. We can at any rate say that the grave issue of compulsory arbitration was avoided; that employers and leaders of organized labor, through the agency of the federal government, in thousands of instances conferred together over wages and conditions, both in the shops and in higher joint tribunals; and that some of the principles which have been established seem to have in them too much of value to stand in danger of being lost.

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FOUR LABOR PROGRAMS

SUMMARY

The four programs described, 344. — The balancing-up program, 345. — Necessity of a balance among factors of production, 346. — Laws of value sometimes independent of social institutions, 347. — Institutions affect value of consumers' goods mainly, they scarcely affect relative values of factors of production, 351. — A slightly unbalanced population makes a collective bargaining program certain, 360. — A badly unbalanced population makes a voting program certain, 362. — An extremely unbalanced population makes a fighting program certain, 366.

ALL programs for the improvement of the condition of the wage workers fall into four general classes, tho there are many combinations and mixtures of these four. For the sake of brevity these four classes may be arranged as follows:

Programs depending upon voluntary agreements among free citizens.

I. The balancing-up programs.

II. The collective bargaining programs.

Programs depending upon authority and compulsion.

III. The voting programs.

IV. The fighting programs.

By the balancing-up programs are meant all programs which aim to create or restore a balance among occupations so as to give those in one occupation the ability to bargain to their advantage as effectively as those in any other occupation. Such a program would aim to enable the unskilled worker, as an independent bargainer, to prosper as well as the skilled worker, the technician, the business manager, or the capitalist. It would aim to equalize the prosperity of different classes

by first equalizing bargaining power, so that each occupational class could, by the simple process of voluntary agreement among free and equal citizens, gain as many advantages as any other occupational class. This would combine equality with individual liberty and initiative. It would leave the individual free to make his own arrangements with other individuals or groups of individuals, every one acting voluntarily and without any compulsion whatsoever. Compulsion would be exercised only to compel the fulfilment of agreements voluntarily entered into, never to compel individuals to enter into business arrangements against their will.

By the collective bargaining program is meant a program under which individuals voluntarily join associations and surrender to the association the power to make business arrangements and agreements for themselves. So long as no force or threats of force are used to compel the individual to join such an association, or to prevent his withdrawing from it, such a program is voluntary and not compulsory. Voluntary agreements among free citizens remain the basis of organization rather than the authority and compulsion of the state or any other organization. This is the type of business organization which has prevailed in free countries under liberal governments.

By the voting programs are meant all programs where the wage workers are to use their voting strength to get control of the government and then use the compulsory power of the government to give them what they want. Much of our social legislation and all programs of state socialism fall in this class.

By the fighting programs are meant all programs under which the wage workers are to use their fighting strength to get what they want, without waiting for the slow process of gaining control of the government by the

constitutional methods of voting. These fighting programs are sometimes called by the more euphonious name of "direct action." Sabotage, strikes accompanied by violence or threats of violence, syndicalism of the more extreme sort, much of the program of the I. W. W., as well as that of Bolshevism, falls in this class.

The purpose of this article is to point out the relation of each of these programs to the others and to the general economic background. It is the belief of the writer that each program is the logical and inevitable outcome of general economic conditions, that one who understands these conditions in any time and place can predict, with some approach to certainty which of the four will be the dominant program, and that the determining factor in each case will be the balance or lack of balance among the various factors of production, human and non-human.

I. The Balancing-up Program.

The idea is too prevalent that bad economic conditions are always and necessarily the fault of some person or some institution, and that the remedy is therefore the punishment of the guilty person or the reform of the defective institution. The fact is that many bad economic conditions grow out of lack of balance among the various factors which have to be combined to get any large economic result. An unbalanced ration means poor nutrition, an unbalanced soil means poor crops, an unbalanced business organization, say a farm, where there is too much land or not enough labor or equipment to cultivate it, means inefficient production, and, finally, an unbalanced nation, which has too much labor and too little capital, too much population and not enough land, too much of one kind of labor and not enough of another

kind to work effectively with it, or any other of an infinite number of possible bad combinations, means ineffective production and is likely to mean a bad distribution of products.

The laws of value, instead of depending, as some would have us believe, upon a whimsical psychology, or an accidental institutional background, are frequently adaptations to the physical facts connected with this problem of balance. If a man is consuming a ration with too much starch and too little protein, his craving for foods rich in protein will increase and for foods rich in starch will decrease regardless of the prevailing school of psychology or the institutional background. This increase in the craving for protein and decrease in the craving for starch will have some bearing not only upon his relative valuation of different foods, but also upon the relative prices which he will be willing to pay for them. If the relative supply on the market of food of the two kinds is such as to make everybody crave foods rich in protein and not crave foods rich in starch, that fact is likely to influence the relative market prices of the two kinds of food. The price is an adaptation to the physiological situation and not to the institutional background. Even under communism, where no open market was allowed to exist, if the one kind of food became scarcer than the other, it would be pretty difficult to prevent people from giving expression to their craving for protein by trying hard to get more of it, either by surreptitious bartering or by stealing.

The farmer whose soil is unbalanced, say with too much nitrogen and too little potash, and who observes that the use of a fertilizer rich in nitrogen adds little or nothing to his crop, whereas the use of a fertilizer rich in potash adds considerably to his crop, is pretty certain to feel a stronger desire for potash than for nitrogen.

Granting that he wants a large crop, the preference for potash as against nitrogen does not depend upon the prevailing psychology nor upon the institutional background. The fact that a larger crop follows the addition of a certain quantity of potash to that already in the soil, whereas the addition of an equal quantity of nitrogen to that already there is not followed by a noticeable increase of the crop, is a physical and not a social or a psychological fact. Even a communistic society, if it perceived that its soil was thus unbalanced, and if it knew that it needed *additional* potash more than it needed *additional* nitrogen, would doubtless make greater effort to get potash than to get nitrogen, tho it might not be wise enough to adopt the simple expedient of allowing people to offer a higher price for the one than for the other.

This principle applies to the ratio of population to land, or to equipment, or to the ratio of different kinds of labor to one another, as well as to the different food elements in a ration or the different elements of plant growth in the soil. A community, whether communistic, individualistic or otherwise, in which there was an abundance of land and labor, but little equipment, would feel the need of *additional* equipment more than of *additional* land or labor. This feeling would be based upon the observation of a physical fact, namely that, with its limited equipment, a few additional acres brought under cultivation would add little or nothing to the total product because there was not equipment enough to cultivate properly the land already in cultivation. Similarly the addition of a few laborers would add very little to the crop because of the lack of sufficient tools for those already at work. But the addition of a few tools and implements of the proper sort would enable the laborers to work to better advantage, and to

cultivate the land more satisfactorily and would therefore result in a larger crop. If, on the other hand, there was an excess of good tools and a scarcity of either labor or land, the community would not desire additional tools so intensely as it would desire additional labor or land. The reason in this as in the other case would be physical rather than social, institutional, or psychological. It would be based upon the observation that a large increase of product followed every addition to its labor or land, whereas no such increase followed an addition to its stock of tools. This would be as true in a communistic as in an individualistic society. It would require rather severe repression to prevent men from giving expression to their desires by offering a high price on the one hand and a low price on the other. If men were permitted to barter, or to buy and sell freely, that is unless these operations were positively repressed, prices would adjust themselves to this fact without the shadow of a doubt.

As suggested above, this principle applies also to the ratio among the different kinds of labor and among the different kinds of equipment. In a community where there were more horses than were needed to pull all the plows, harrows and other implements that were to be had, it would add very little to the crops to add a few horses to the existing stock, but it would add considerably to the crop if a few plows, harrows and other implements could be added. Opposite results would follow, of course, if it should happen that there were more plows, harrows and other implements than the existing stock of horses could pull. Again, if in a cotton mill town there were more spinners than were needed to supply yarn to the weavers, it would not add much to the total output if a few more spinners should appear on the scene, whereas if a few more weavers were to appear, it

would make a great deal of difference. Under such circumstances, it would be more advantageous to the community, assuming that it wanted cotton cloth, to add to its corps of weavers than to add to its corps of spinners. This advantage would, if it were understood, lead to a stronger desire for more weavers than for more spinners. One way to get more would be to offer a higher wage. This is not the only way — weavers could, for example, be conscripted as soldiers are. Liberal communities have generally preferred the less drastic method of offering a higher wage for the kind of labor which is scarcer in proportion to the need for it. This would result in an uneven distribution of the product of the cotton industry.

It is true, of course, that this lack of balance between the number of spinners and the number of weavers could not last very long. Between those two occupations there is no great gulf fixed. The balance would soon be restored, if it were ever destroyed, by the habit of seeking the more attractive occupation. But there is a much wider gulf fixed between other occupations, between, for example, such occupations as that of unskilled laborers and employers, between bookkeepers and general managers, etc. In such cases it is not easy to preserve a perfect balance, and consequently an industry may remain for a long time in an unbalanced condition as respects such occupations as these.

It goes without saying that the necessity for a balance among the various factors of nutrition and production is a physical or a physiological necessity. It goes deeper than fashion; it is more fundamental than any human institution. Many of the laws of the market are based upon this necessity, and the market itself as an institution is an organized attempt to adjust ourselves to it. Many other human institutions, instead of being a back-

ground for the laws of value, are merely outgrowths of these laws.

There are, to be sure, other cases where convention, custom, fashion or whim is a determining factor in value. In all such cases it may with justice be said that a knowledge of the institutional background is necessary to an understanding of the phenomena of value. For example, the Mohammedan's abhorrence of pork is wholly an institutional affair. But whether one were Mohammedan, Jew, or Christian, would not make the slightest difference in the results of a feeding experiment. If a pig were given too much starch and too little protein, and it were found that adding protein would add considerably to his growth, whereas adding starch would not, we should be dealing with a physical fact. In short, our institutional background affects mainly our valuation of pork rather than the relative valuation of different factors in pork production. In general, institutions may be said to affect our valuations of consumers' goods rather than of productive agents. The relative values of productive agents is determined almost exclusively by the physical and objective facts relating to their balance or lack of balance in the physical process of production.

So far as the labor market is concerned, customs, traditions and institutions have their principal effect first, on the incomes of those classes which Mill and other economists denominated as unproductive laborers, that is, of those who render direct personal service and do not aid in producing vendible commodities; second, on the incomes of those who, without coöperation, produce a complete consumable commodity. The first includes barbers, valets, servants, physicians, lawyers, teachers, preachers and a multitude of others. Whether barbers flourish or not will depend, of course, somewhat upon

styles. Whether physicians of various schools earn good incomes or not will depend upon a multitude of circumstances, including the habits of the people, the repute in which the various schools are held, etc. Similar observations could be made regarding all other classes who render direct personal service. Institutions affect the value of their services very much as they do the value of consumers' goods. But granting that a consumer's good is sufficiently desired to give it a price on the market, then the relative value of the factors which enter into its production is mainly a question of physical fact which can be ascertained by physical experiment. If a teetotaler who abhorred whiskey could bring himself to manufacture whiskey for the market, if a Quaker who abhorred jewelry could bring himself to manufacture jewelry, or if a Mohammedan who abhorred pork could bring himself to produce pork, he would reach the same conclusions, in any given time and place, as to the relative value of the different factors of production as would be reached by any other producer of equal intelligence.

The second group, that consisting of individuals who, unaided and without coöperation, produce consumable commodities in complete form, is almost negligible. The fisherman who sells his individual catch may be cited as an example.

The labor problems which are acute at the present time relate to the compensation of labor which works in combination with many other factors in production. Those laborers who render direct personal service and those who produce by individual effort alone sometimes have their grievances. These grievances occasionally give rise to what may be called a special social problem, but such problems differ materially from those labor problems in which the public is now chiefly interested. These problems are all more or less directly concerned

with the question of sharing the products of those industries which combine many factors, including not simply labor, land, and capital, but many kinds of labor and many kinds of capital. This is precisely the kind of a problem with which psychology, custom, tradition, government, religion and other institutions have very little to do directly, tho they may exert a great deal of indirect influence. This problem resembles that of the relative importance to plant growth, in a given situation, of various elements in soil fertility, of the relative importance to animal growth, in a given ration, of the various elements of animal nutrition, of the relative importance to farm production, in a given combination of productive factors, of different items in the equipment. It is a question of physical fact which could, in any case, be determined by physical experimentation if any one were willing to go to the expense of running the experiment station.

This is always a question of having *more* or *less* of a given element, and not of having *some* or *none* of it, in a given combination. In a given soil, it is a question of the importance of having more or less nitrogen, not a question of having some nitrogen or none at all, which interests the real farmer. The " flower-in-the-crannied-wall " philosopher would doubtless say that, " absolutely speaking," or in terms of the " higher logic," nitrogen is no more important to plant growth than silica or a number of other soil ingredients. The scientific farmer knows that his soil generally contains all the silica his crops can possibly use, and some more besides, and that therefore it would not be good economy to buy any more. He also knows that in most soils there is less available nitrogen than his crops can use and that a little more nitrogen would be followed by a little more crop. When he is certain of that, the kind of logic which he

needs in his business will lead him to buy nitrogen provided its price is not above that of the expected increase in his crop.

A fertilizer company has recently been in actual operation in New England, trying to sell a fertilizer containing none of the elements of plant food which farmers ordinarily buy, but very rich in silica, that is, sand! This company published statements of scientific men to the effect that plants required silica for their best growth. It could probably have been demonstrated that a soil absolutely devoid of silica would not grow crops at all. Therefore, some would argue, silica is the great producer of crops. This argument might be sufficient to satisfy the demands of " the higher logic," but it was not sufficient to satisfy the demands of scientific farmers, nor did it prove to be sufficient to satisfy the court, nor to keep the promoters of this company out of jail.

It was suggested above that while institutions could have very little direct influence upon a problem of this kind, they could have considerable indirect influence. In a community where soils need more nitrogen to secure better crops, but do not need more silica, institutions could scarcely succeed directly in giving nitrogen and silica equal values. They might succeed indirectly if they could set forces to work which would make soil nitrogen as abundant as silica, or silica as scarce as soil nitrogen. In a community where foods rich in protein were physically scarce relatively to needs, whereas foods rich in starch were physically abundant, institutions could scarcely succeed directly in giving equal values to various kinds of food. If the government or any other institution could set forces to work which would make different kinds of food equally abundant or equally scarce, the equality of values would take care of itself.

Such a program could properly be called a balancing-up program.

This balancing-up program may be vastly extended. Governments, schools, and other institutions may easily set forces to work which will accelerate the accumulation of capital, and eventually make it so abundant relatively to land and labor as to give capital a smaller and labor or land a larger share in distribution. Forces may also be set to work which will spread population over wider areas, reduce the intensity of the demand for favored locations and reduce rent, leaving larger shares to the other factors. It would be very easy to set forces to work which would reduce the number of unskilled laborers and increase the supply of employing talent. This would automatically result in some approach to equality, at least it would result in higher wages for unskilled labor and lower incomes for the employing classes. If carried far enough, a balancing-up program would give us something approximating to equality of income without sacrificing individual freedom.

A social system in which each free individual made his own business adjustments on the basis of voluntary agreement with other free individuals, and where, in addition to this universal freedom there was universal and approximately equal prosperity, would certainly be more desirable than a system which secured liberty without equal prosperity or equal prosperity without liberty. The balancing-up program is the only program which can possibly give us both. All other programs sacrifice one or the other.

In order to make capital so abundant as to reduce the share of the capitalist class and increase the share of the laboring class we need, first and foremost, a general, aggressive and permanent thrift campaign. The twin virtues of thrift and industry have been very unequally

cultivated in almost every community. While thrift is quite as important as industry to national prosperity, it has by no means received the encouragement that industry has received. Training for industry has been provided at public and private expense, every kind of social and moral pressure has been brought to bear upon the young to be industrious. No one has commended the idle man, but many have commended thriftlessness and extravagance. Advertisers and salesmen have never exercised their arts and blandishments to induce men to be idle, but they have done much to induce men to be thriftless and extravagant. Only a few agencies have been working effectively to induce men to save and invest their incomes. One very important step would be taken toward balancing things up, if as many encouragements and temptations and as much social and moral pressure could be brought to bear upon men to induce them to save as are now brought to bear to induce them to work.

He who saves money, and invests it wisely, does himself good in two ways. He gains directly by having an income in addition to his wages or his salary. He gains indirectly by making better conditions for everybody including himself.

It is easy to see that he gains directly. To have a hundred dollars invested, at four and one-quarter per cent, is better than not to have it. It gives him four dollars and twenty-five cents a year over and above his other income; and four dollars and twenty-five cents a year, small as it is, is not a sum to be despised.

It is not so easy to see, but it is none the less true, that saving and wise investing make conditions better for everybody including oneself. Show me a community where there is little saving and investing and I will show you a community where conditions are bad, however

ich it may be in natural resources. It is always a community in which there is little employment and low vages. It is always a community from which laborers migrate in order to find more employment and better vages. On the other hand, show me a community where here is a great deal of saving and investing and I will how you a community where conditions are good, where here is much employment and good wages, a community to which laborers from other communities come in arge numbers in order to find work.

There are good and sound reasons for the historical act that conditions are good where there is much saving nd investing, and bad where there is little saving and nvesting. To save and invest is not to hoard. It is to uy things which are needed for production instead of hings which are good only for consumption. To buy hings, such as tools, machines, buildings, etc., which aid n production is to encourage the production of such hings. When many people are investing in such things, nany will be produced and industry will then be well quipped with aids to production. In short, there will e many factories well equipped with buildings, machines, and materials. That is a condition in which here is much employment.

One may buy either directly or indirectly those things hich aid in production. When a farmer buys a traction engine rather than a luxurious automobile he is buying directly a thing which aids in production rather than n article of consumption. If he has bought wisely, the raction engine will aid him to grow a larger crop, which s a good thing for him. It will also increase the food upply, which is a good thing for everybody. The more armers there are who save money and invest it in instruments which aid in production, the better production we shall have and the better the world will be fed.

When a factory owner builds an addition to his factory rather than a new dwelling-house he is buying directly various things which aid in production. If he builds wisely he will add to his income, which is a good thing for him. It will also add to the productive power of the community, which is a good thing for everybody. It is a good thing especially for laborers, because it will require more laborers to run the enlarged factory than were required before it was enlarged. In short, it increases the demand for labor.

The more people there are who save their money and buy tractors, machines, factory buildings, and all other aids to production, the better the community will be supplied with all such things. The better the community is supplied with all such things, the greater its productive power, and the greater the opportunities for productive employment. That is the reason why laborers always emigrate from a country where there is little saving and investing to a country where there is much saving and investing.

But one may buy indirectly things which aid in production. When one deposits money in a savings bank, the bank will invest it. It may lend it to some farmer who wants to buy a tractor, a team, a cow, or some other aid to production. It may buy part ownership in some factory, or in some other way encourage the buying of aids to production. In all these ways, and in many others, one may buy indirectly all sorts of things which aid in production.

Indirect buying of such things has the same effect as direct buying. It encourages others to make the tools, machines, buildings, and other things which aid in production. Nobody would make such things unless somebody would buy and pay for them. The only people who buy and pay for them are they who save and invest,

who buy fewer articles of consumption than they might buy, and spend the money thus saved for things which aid in production. That is what it means to save and invest.

Some of the most needed investments in time of war are War Savings Stamps and Liberty Bonds. To own a Liberty Bond is certainly better than not to own it. It is not only better for the individual, it is also very much better for the whole country and the world that individuals should buy Liberty Bonds than that they should buy articles of consumption which they do not really need, even tho they would like very much to have them. If they buy Liberty Bonds, the government will spend that money to hire men to build ships, make guns and ammunition, and do whatever else is necessary for the defense of the liberty of the world. It is better for everybody that men should spend their money indirectly for these things than that they should spend it directly for some article of consumption which they do not really need.

In time of peace it is almost as desirable from the standpoint of the world that the individual should buy, either directly or indirectly, aids to production as that he should, in time of war, buy aids to warfare with his surplus income. Let us suppose that two communities have equal incomes and are able, at a given time, to spend equal amounts of money this year in purchasing goods or hiring labor to make goods. Let us suppose that Community A spends all its clear income this year on consumers' goods, spending only enough on producers' goods to keep its supply of capital intact, whereas Community B spends half its clear income this year on producers' goods, and only half on consumers' goods. There will be as many goods purchased this year, and as much labor employed in Community B as in Com-

munity A. The difference will be that half the available labor power in Community B will be employed in making producers' goods, whereas all the available labor power in Community A will be employed in making consumers' goods.

Next year, however, Community B will be better equipped with producers' goods than Community A. Its total product, that is, its real income, will be larger than Community A's. It will have more to spend and will be able to employ more labor or employ it to better advantage. If it continues spending half its enlarged income on producers' goods, adding largely to its productive equipment from year to year, it will outstrip Community A and leave it farther and farther behind. In a short time laborers from Community A will be migrating to Community B, where there is more employment and better wages.

The different items in a balancing-up program need not be discussed in detail. Most of them will occur to any economist who will give the subject a little thought. The author has previously outlined such a program in a book entitled *Essays in Social Justice.*[1]

II. The Collective Bargaining Program

The indispensable man can generally get what he wants by the method of voluntary agreement. The superfluous man will have difficulty. To the man who, in any industrial situation, is indispensable, freedom means freedom to prosper. To the superfluous man, freedom may mean freedom to starve and is pretty certain to mean freedom to be relatively unprosperous.

Any industrial condition in which one man is indispensable and another superfluous is necessarily an un-

[1] Harvard University Press, 1915. Cf. Chap. x.

balanced condition. No man is indispensable if there are plenty of others who can do the same kind of work which he does. No man is superfluous unless there are more than are needed to do the kind of work which he can do. A situation in which no class of men was so small as to make any one indispensable, and no class so large as to make any one superfluous would be a better balanced situation. One in which all were about equally needed would be perfectly balanced.

Even in an unbalanced situation, while the individual in a large class may be superfluous, the class as a whole is indispensable. There may, for example, be so many ditch diggers as to make any individual among them superfluous, nevertheless, ditch diggers as a class may be indispensable. The superfluous individual, bargaining alone, is weak and can never, so long as he is superfluous, bargain to his own advantage. The indispensable class, if it can bargain as a unit, can take advantage of its indispensability and bargain to its own advantage. Therein lies the philosophy of the collective bargaining program.

Its reason for existence is found, however, in an unbalanced industrial system. A kind of labor which is scarce enough to make each individual laborer practically indispensable would not need collective bargaining. Individual bargaining would give them their full share in the general prosperity. To use collective bargaining to add still more to that prosperity would not be a means of defense but a means of extortion. It would not differ in any essential particular from the trust, and the public would soon become as impatient of collective bargaining on its part as it has already become of collective bargaining on the part of the trust.

Where the lack of balance among the factors of production is not so very extreme, that is, where there is no

great overabundance of one factor and no great scarcity of another, collective bargaining on the part of those who sell the overabundant factor is a sufficient remedy. That happens to be the situation in the United States with respect to most forms of skilled manual labor. Skilled laborers are not so numerous as to place them at any great disadvantage in the bargaining process. Such disadvantage as they suffer can generally be overcome by the simple process of collective bargaining. They are not strongly tempted to adopt either the voting or the fighting program; first, because they have no such grievance as would justify their surrender of individual freedom; second, they are not numerous enough to give them much voting or fighting power.

III. The Voting Program

Generally speaking, the more numerous any industrial class happens to be, the weaker its members are in the process of bargaining on the free and open market. But the numbers which make them weak in bargaining make them strong in voting. On the market they are at a disadvantage; in politics they are at an advantage. The greater their weakness on the market, the greater their voting strength in politics.

As stated above, where the disproportion of numbers is not so very great, the disadvantage in bargaining is likewise not so very great, neither is their voting strength so very great. Under such circumstances, the voting program does not seem to be necessary, nor does it promise much success. Collective bargaining is the only logical program. But where the disproportion is very great, the voting program seems to be more of a necessity and, what is more to the point, it promises greater success.

In a community where any class of wage workers, say unskilled laborers, outnumber all other people, the oversupply of unskilled workers will make their position on the labor market very difficult. Even collective bargaining has its limits, mainly because of the difficulty of keeping so large a mass together in order to bargain as a unit. But since they outnumber all others, their voting strength is overwhelming if they can be induced to vote as a unit. They could easily control the state, elect the entire personnel of government and use the compulsory power of the government to gain their own ends. As a matter of fact, they would not even have to take the initiative. Candidates for the salaries and emoluments of public office would certainly appreciate their opportunities. They would seek the votes of this class which had so many votes to give by offering it everything it wanted, even more than it had the courage to ask for. The voting program is therefore almost a certainty in any community where the disproportion of occupational classes is very great.

This will explain why the dominant elements in American Trade Unionism have always stood for a collective bargaining rather than for a voting program. They have not needed to control the state in order to gain fairly good wages for themselves, and, moreover, they have not had votes enough to control the state even if they had wanted to. It will also explain why English laborers have adopted a voting program. The disproportion between wage workers and other factors of production or other elements in the population is much greater there than here. In bargaining, English laborers are therefore weaker, and in voting stronger than American laborers as a class. English laborers therefore have greater need of the help of the state, and greater power to gain control of the state than have American la-

borers. The sheer logic of this situation calls for a greater trend toward socialism there than here.

Other classes besides laborers have shown the same tendency to use the state to help them out of a situation in which their bargaining power was reduced. In the seventies and eighties of the last century there was a disproportionate production of agricultural crops in this country. The rapid settlement of the rich prairies of the West had poured a flood of agricultural products upon the markets of the world. This put the farmers at a disadvantage on the free and open market. Their numbers proved to be their weakness on the market, but their strength at the polls. They were not slow to realize the situation and to use their voting strength rather than their weakness. Even if they had been slow to realize it, they were abundantly reminded by a swarm of candidates for office who had uses for the large farmer vote. Since 1909, the farmers have not been so numerous relatively to the rest of the population as to place them at a great disadvantage on the market, nor to give them a great advantage at the polls. Consequently they are not now demanding so much help from the government. In fact, the demand for price-fixing and similar government interference has not come recently from the farmer but from the urban consumers. At the same time, the candidates for office have, except in the far Northwest, almost forsaken the farmer and have become very solicitous of the labor vote.

There was also a time when the manufacturers, especially those starting new lines of manufacturing, felt weak on the market, or thought that they did when brought into competition with old and well established rivals across the water. They then turned to the state for help. They were able to deliver considerable numbers of votes. The result was that candidates for office became solicitous as to the welfare of infant industries.

In England, after the Black Death, when labor was scarce and hard to find, laborers were strong in bargaining but weak in voting because they had no votes. The employing classes were temporarily weak in bargaining but strong in voting, since they did whatever voting was done. At any rate they controlled the state. They were not slow to use the state to help themselves in the bargaining process.

In view of all these experiences, it is pretty certain that any class which finds itself so numerous as to be weak in bargaining and strong in voting will make use of a voting program. It is not so certain, judging by past and present experience, that it will use its voting power wisely. In fact, no case has yet appeared where a voting program adopted under such conditions was not destructive rather than constructive, which was not demagogic rather than economic, which did not consist in killing the goose that laid golden eggs in order to seize the whole stock, rather than in increasing the flock. But that is not the important certainty. The important certainty is that wherever and whenever such an unbalanced condition is allowed to arise as that which exists in England today, a voting program similar to that which has been paraded in this country as the program of the British Labor Party is certain to be adopted. Tho it lacks a single constructive feature, tho it is made up exclusively of scraps of Marxian jargon, catch phrases, and shibboleths, nevertheless, it is the kind of a program which any class is likely to adopt in its own interest when it for the first time concludes that it can outvote other classes and control the state.

IV. The Fighting Program

It is sometimes affirmed that the labor program of the British laborers is more "advanced" than that of the American laborers. By the same token the program of the Russian laborers is more "advanced" than that of the British. The disproportion of the wage workers to other urban classes is also greater in Russia than in England, as it is in England than in the United States. That is to say, there are fewer technicians, business men, capitalists and smaller accumulations of productive capital, and fewer productive establishments calling for men in proportion to the number of men available to man them. This disproportion puts the Russian laborers, particularly the great mass of ignorant and unskilled laborers, at a still greater disadvantage in bargaining, but gives them vastly greater strength in other ways.

Numbers give strength not only in voting but also in fighting. Fighting, provided victory is certain and overwhelming, is a shorter cut to what is wanted than voting. To be sure, it may, like other short cuts, not work well in the long run, but it looks like a quicker method of getting possession of accumulated wealth than the voting program, as the voting program is quicker than the program of industry, thrift, and sound investing.

Where the numerical strength of the wage workers is not overwhelming, fighting may prove expensive even tho ultimate success looks pretty certain. Voting looks like a cheaper program than killing. But where numerical strength is so overwhelming as to make victory in fighting not only certain, but cheap because of the absence of power of effective resistance on the part of other classes, the fighting program is pretty certain to be adopted.

It is useless to point out to a great mass of ignorant and unskilled labor that even tho they have the power to take possession, with very little fighting, of the accumulated wealth of the country, still they would better not do it because, in the long run, they will lose more than they will gain by it. If they were capable of appreciating such arguments, they would not be ignorant and unskilled laborers. Men are not ignorant and unskilled laborers in industry and at the same time farsighted statesmen in politics. They are just as ignorant and short-sighted with respect to public as with respect to private affairs.

Therefore we may conclude that whenever and wherever a nation becomes so unbalanced occupationally as Russia is, the fighting program is certain to be the dominant labor program. In short, we in this country can have any one of these four programs which we choose to have. If we balance things up, none of the other programs will become dominant or dangerous. If things become slightly unbalanced, some kind of a collective bargaining program is certain to grow out of the situation. If they become somewhat more unbalanced, a voting program is certain to become the dominant program supported by the numerically superior class, whose numerical superiority makes it weak on the market but strong at the polls. If they become still more unbalanced, the numerically superior class, finding itself hopelessly weak on the market, but overwhelmingly strong in the use of physical force, will use its strength to take what it wants.

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NOTES AND MEMORANDA

INTERNATIONAL TRADE AND PRICES

In the Quarterly Journal of Economics for February, 1918, Professor Wicksell has a note on price levels and international trade which suggests certain comments. Professor Wicksell approaches the problem throughout "from the goods end" so to speak; that is to say, he regards the movement of goods and not the movement of gold as the primarily effective factor in the changes in price levels produced by changes in international trade. Tho of course the movement of goods is the ultimate thing in all kinds of trade, yet it appears to me that Professor Wicksell underestimates the active influence of the money factor and that in consequence his account often does not represent fully the actual course of events.

Professor Wicksell's note contains two parts. The first deals with the effect of borrowing transactions between countries. Assume two countries under a free trade régime with only a land boundary between them, both having a gold currency. One borrows from the other. The result according to Professor Wicksell is increased "power of purchase" in the borrowing country and decreased power of purchase in the lending country, increased imports to the former and decreased imports to the latter, but no change in price levels. But the increased quantity of goods "will require a greater quantity of money to put it in motion" and a certain amount of gold will "pass automatically" to the borrower. This transmission of gold will appear at the beginning of the period of borrowing and then stop and its effect will be not to raise prices in the borrowing country but only, by maintaining the proportion between goods and money in the two countries, to keep prices

up to the old level in the borrowing country and down to the old level in the lending country.

It appears to me that the exact effect of the borrowing transaction will depend on the form in which the loan is taken. Suppose the borrowing country chooses to take the loan in the form of money — then the supply of bills drawn on the lending country, or the demand for bills on the borrowing country will increase, exchange will move in favor of the borrowing country, and if it moves beyond the gold point, gold will flow in and all prices and money incomes will rise. This rise will increase the country's effective demand for imports—which will not have risen in price — and they will increase. Ultimately of course, the gold will flow out again to pay for the increased imports and the old price level will be restored. This process involves a movement of gold and a change in price levels before the movement of goods takes place at all.

Suppose, however, that the borrowing country takes the loan in the form of goods — that is to say, suppose it spends the borrowed money in the lending country. Then the quantity of goods it imports will increase. This is evidently the case contemplated by Professor Wicksell. The imports of the lending country will have decreased relatively to the imports of the borrowing country. Whether they will have decreased absolutely depends on whether the loan represents a transference of demand from imported commodities to domestic commodities or not. In other words, it depends on whether the money, if it had not been lent to the borrowing country which, by hypothesis, spends it on the products of the lending country, would have been spent on imported goods or on goods produced at home. If it would have been spent on goods produced at home anyway, the fact that it is sent to a foreign country will obviously make no difference to the quantity of goods imported by the lending country. Whether the demand will in fact be transferred from imports to domestic commodities depends on the marginal utilities of imported and domestic goods to the savers who provide the loan. If in response to the demand for a loan they increase their saving they will obviously curtail their consumption of

those things whose marginal utility is lowest to them. If, however, the loan is created by an inflation of bank credit and does not represent real saving, there will be no transference of demand, and the lending country's imports will not be affected anyway — at least so far as the short period is concerned. In any case, however, the quantity of goods relative to the quantity of money will be increased in the borrowing country and decreased in the lending country; general prices will fall in the one and rise in the other. Eventually, but only, as Professor Taussig points out,[1] over a long period and not " automatically . . . at the very beginning of the borrowing period," gold will flow to the borrowing country and the relation between the price levels of the two countries be readjusted; in the intervening period, however, price levels will have been affected.

To consider the application of this analysis to two practical cases — the rise in the level of Indian prices during the period 1903–07 is attributed, among a number of other causes, to the large borrowings of foreign capital which were made during those years.[2] It is evident that whether the influx of capital had the immediate effect of raising prices or not depends on whether the loans took the first or the second of the two forms described above. In the first case, an influx of capital would immediately produce a rise in general prices; in the second case it would produce an immediate fall (or a check to an existing rise) and a compensatory rise later. Again in the case of a loan raised in America by England during the war, the second case is probably the actual one. If this is so, we should expect a check to the rise of prices in England and an increased rise in America. Thus the absence of that fall in the American price level which Professor Wicksell expects theoretically to result from the borrowing transaction may be due to other causes besides the alleged world depreciation of gold.[3]

The second part of Professor Wicksell's note is concerned with the effect of borrowing on international trade through

[1] Quarterly Journal of Economics, February, 1918, p. 411.

[2] J. H. Keynes, " Recent Economic Events in India," Economic Journal, 1909, p. 51.

[3] Cf. Quarterly Journal of Economics, February, 1918, p. 409.

its effect on costs of transport in the case of two countries separated from each other by sea. If America borrows from England, then, he says, freight rates to America will rise (because of the increased quantity of goods to be carried) while freight rates from America will fall. Then the prices of " both imported and exported goods will have a tendency to rise in America and to fall in England " and " consequently the general level of prices will have been raised in America and lowered in England."

In this statement it does not seem clear in what connection the words " rise and fall " are used. Prices will rise or fall relatively to what ? — Relatively to prices of the same things in the other country at the same time, or relatively to prices of the same things in the same country at a previous time ? Evidently what will actually happen is this. Suppose A is the borrowing and B the lending country. Prices of imports to A will rise relatively to the prices of the same things in B at that time and relatively to the prices of the same things in A before that time — i.e., before the borrowing process began; on the other hand, the prices of goods exported will rise in A relatively to their price in B at the same time but not relatively to their price in A before the process started. The general level of prices in A will not so far be affected because it can only be affected by a change in the quantity of money or in the quantity of goods exchanged. Similarly the price of B's imports will fall relatively to their price in A and to their price in B before but the price of exports will only fall relatively to their price in A. The general level of prices will not be affected. What is important in this is the rise in the price of A's imports relatively to what they were before and the fall in the price of B's imports relatively to what they were before. This rise and fall will affect demand in A and B. The exact result on the general level of prices in the two countries will depend on the elasticities of their respective demands. If, for instance, A's demand for B's goods has an elasticity greater than unity while B's demand for A's goods has an elasticity equal to or greater than unity, the aggregate value of A's exports will exceed the aggregate value of her imports,

gold will flow to A and the general level of prices there will rise. If, on the other hand, the elasticity of A's demand is less than one while the elasticity of B's demand is equal to or less than one, the aggregate value of A's imports will exceed the aggregate value of her exports, gold will flow to B and the general level of prices there will rise. This rise or fall in A's prices will be proximately the result of gold movements and there will not be first a rise in A's price level and then an influx of gold to support that rise.[1] In fact, as Dr. Fisher says " so far from its being true that high prices cause increased supply of money, it is true that money avoids the place and time of high prices and seeks the place and time of low prices, thereby mitigating the inequality of price levels." [2]

The effect of issuing more convertible bank notes in the borrowing country would be nil if the issue was completely covered by gold, since it would presumably be accompanied by the withdrawal of an equivalent amount of the precious metal. An issue of partially or wholly inconvertible notes would raise the price level and tend, by increasing the country's effective demand, to alter the effect of the rise in import prices, aggravating it if the elasticity of the borrowing country's demand for imports were less than unity, and counteracting it if the elasticity were greater than unity. The English price level has risen during the war owing, in part at any rate, to the overissue of treasury notes and the inflation of bank credit. It appears probable in view of the extreme urgency of the need for war material that the English demand for American goods is very highly inelastic, probably it has an elasticity less than unity. In this case the rise in the price level will aggravate the existing effect of a rise in import prices and the aggregate value of English imports will be larger than if either of these monetary phenomena did not exist.

The American demand for English goods must be much more elastic, probably it is greater than unity. If this is so, the short period effect of borrowing by England in America

[1] Quarterly Journal of Economics, p. 408.

[2] Fisher, Purchasing Power of Money, p. 173.

ll be to make the aggregate value of both their imports eater than before. Which will be the greater of the two pends on the exact relation between these elasticities, a re-tion which could only be determined by detailed statistical udy.

We have seen that the overissue of treasury notes and the nflation of bank credit would tend to increase the aggregate alue of English imports. If we assume that the effect of orrowing operations has been such as to increase the aggre-ate value of American imports less, or only slightly more han the increase in English imports due to the same cause, hen the inflation of English currency by aggravating the ffect of the borrowing transaction on English imports would end to make these much larger than American imports and o cause an outflow of gold and a fall in the English price evel. But under the actual circumstances this inflation may lso have a different and contradictory effect on the price evel. Disregarding for the moment the complications re-sulting from borrowing transactions, suppose there had been o inflation. If the English price level had then been lower han the world level gold would have flowed in and pushed English prices up. But if local non-monetary causes of a high rice level had been such as to make the English level higher han the world level, then gold would flow out of England. n this last case the existing restrictions on gold export, the ncomplete convertibility of treasury notes and the continu-us and rapid inflation of credit would be responsible for a ery large part of the rise in English prices, for the continuous ssue of fresh paper and bank money would counteract, or nore than counteract the effect of any such outflow of gold s might occur in spite of the prohibition.

J. E. NORTON.

CAMBRIDGE, ENGLAND.

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THE

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MAY, 1919

THE RELATIONS OF RECENT PSYCHOLOGICAL DEVELOPMENTS TO ECONOMIC THEORY

SUMMARY

The purely objective factors in economics, 377. — Psychological disciples necessarily used in addition, 381. — Social assumptions, 385. — Psychical factors are human motives, 387; their analysis needed for most social problems, 389. — Adequacy of psychology assumed in economic theory in dispute, 390. — Analysis of arguments pro and con, 392. — Hedonistic foundation, 394. — Costless production, 401. — Industrial peace, 404. — Sums of utility, 406. — Social demand, 407. — Institutional economics, 409. — Most accurate psychology needed, of producers' motives, 415; of consumers' demands, 419.

In spite of several attempts made in recent years to improve upon economic theory by renovating its psychology, economists in general do not perceive that psychological debates are relevant to economics. They have not been convinced that any real economic principles have been invalidated by the "new psychology" that has been exhibited to them, or that the latter promises any profitable extension of the body of economic theory.

It is said, for instance, that the generalized man assumed by our theory, who was supposed to pursue his economic interests in usually reasonable ways, must be

superseded by the real man known to modern psychologists, the creature of unreasoning hasty moods and propensities to heedless action. Well, what of it? is the reply. Granting that people's wants are determined frequently by instincts, and often by imprudent ones at that — what change does it necessitate in economic principles? We do not need to account for the origin of wants; our business is to study the means of satisfying them, and the conditions under which they may be satisfied. An ordinary degree of foresight with respect to these means does not seem to be such a far-fetched assumption. The other objections have seemed to be as easily met, and on the whole, in the hearts of most economic students, no conviction of sin has been awakened, altho the "psycho-economists" have been pressing their attacks, in different quarters, for over twenty-five years.

Some of the skeptics suspect that the trouble arises from too exclusive attention being given by the innovators to the subjective, or mental elements of economics, and from a preoccupation with the exceptional or abnormal cases even in that limited field. Results so obtained, of course, would hardly call for a revolutionising of economic theory as a whole. It seems to the present writer that much of the criticism from the standpoint of modern psychology heretofore made by economists is inadequate, both as to psychological facts and their applications to economics, and the object herein is to make it clearer where the psychological discoveries and economic theory do fit together.[1] But let us at the very beginning safeguard ourselves against material fallacy by giving the purely physical factors of economics their

[1] The present writer is preparing a thesis in which questions of fact in psychology related to economics are considered. The discussion in the present paper, however, is concerned only with the place which psychological data have in economics, assuming them to be true.

due — those which are stubbornly indifferent to human thoughts or preferences. Then we may consider some ways in which psychical forces coöperate with these external facts to produce the activities we study.

Whether we like it or not, as Mill said, " a double quantity of labor will not raise on the same land a double quantity of food, unless some improvement takes place in the processes of cultivation." And the principle of diminishing quota of " overhead " expense to the unit of product, as volume of output increases (the basis of " increasing returns "), is likewise simply a way *things* have of acting. So is the pure fertility of the human species, with its enormous potentialities for the destruction of men's hopes. Whatever other factors may enter into the value of money, it seems clear that its quantity, by purely mechanical principles, must be a part of the explanation.

The superior productivity of labor which is specialized, moreover, and the gain in the efficiency of labor through saving and the use of tools or machinery, are not the projections of anyone's mind, tho we may choose either to regard or disregard these facts. But having once chosen, we must take the consequences, and cannot change the results by wishing. If we decide to do without the capitalists, and do not otherwise provide for the saving of wealth, our society as a whole will have perforce to work harder for its daily bread. The foregoing purely objective observations we recognize as economic principles which Adam Smith, Ricardo and Malthus elaborated and stressed; and these contributions at least, must not be included among the " tissue of false conclusions " which the classicists are supposed to have constructed from false psychological assumptions.

To illustrate further: The " law of variable proportions " is a name given to an external fact which shapes

the world's values no less than do the reason and passions of men — the fact that in most productive processes, an increased use of one ingredient, all others remaining stationary, will result in a larger total product, but in a lessening proportion to the units of the ingredient which is being increased. If you are smelting iron, or making shoes, or growing wheat, you will find that increasing applications of coal or leather or labor, the other factors in the processes remaining the same, will yield less and less increase in the output of pig iron or shoes or wheat. The most advantageous combinations are based on natural laws, or "habits of matter," which our technology takes increasing advantage of (through processes in part psychological) but cannot change. Under no conceivable social arrangements can the superabundant elements be made as valuable as the less abundant, or limiting, elements.

Without attempting to enumerate the special physical, mechanical, geographical or biological facts and uniformities which economic science must use as presuppositions, there is still another sense in which economic principles are independent of human volitions. Economic theory treats of means of economizing, or using without waste, the limited resources which nature affords to satisfy men's wants. Men usually try to get as much coat as possible out of their cloth, and economics gives them some information as to how to accomplish that result on a large scale. They can accomplish it only by acting reasonably, it is true. But suppose you can point out a group of people who have irrational and uneconomic ideas which they prefer to follow: does that prove the theory to be unreal and irrelevant to actual life? Let us see. The Indians of Paraguay, according to the account cited by Mill, sometimes killed for supper the oxen which the missionaries had given them; "thinking,

when reprehended, that they sufficiently excused themselves by saying they were hungry." [1] Their conduct was "natural" enough, but it was not "economic" — that is, it did not work economically. Since there are other peoples in the world who keep their oxen for work, and eventually need more land, there is every prospect that the Paraguayans will be eventually displaced by them. Hence the principles of economy are not exactly "idle tho true," even if not practiced by every one.[2]

But the foregoing instances of the purely objective subject-matter in economics must have called to mind several psychological principles which are closely associated with such physical data as these, throughout economic discussions. We are accustomed to think of the Malthusian law of animal fertility in connection with the theory of wages, an essential part of which is the doctrine that human self-restraint keeps population within the physiological maximum in practically every civilization. It may restrain the increase only to the point where a very scanty subsistence can be earned by each man, or it may under certain circumstances maintain a much better "standard of living" by placing a sufficient check upon reproduction. Besides this, every theory of wages must make several further psychological assumptions concerning the motives to work and to idleness, the relations of differences in wages between occupations and within occupations to maximum effort; the theory of human nature implied in the concept of non-competing groups; the effects of various wage systems and of scientific management; the mobility of labor, how affected by "non-economic" motives; and so on. If we assume that men will, in general, work as effectively for a smaller as for a larger wage, our con-

[1] Mill, Principles, Bk. I, chap. xi, § 3.

[2] See remarks by Professor T. N. Carver along this line in "The Behavioristic Man," Quarterly Journal of Economics, vol. xxxiii, pp. 195–199, November, 1918.

clusions will point toward the desirability of equal wages to all workers. In any treatment of labor problems and industrial peace, the other human nature elements are of course many and various.

Again, mention of the technical advantage of capital and the division of labor calls up many subtle discussions of the motives which induce and counteract saving, the "preference for present over future goods"; and we remember some questions about the motives which the business man has for buying the present goods, launching them into round-about production, and agreeing to pay interest. Some kind of subjective resistance against saving, which apparently has to be overcome by the payment of interest, has long been a fundamental assumption in economic theory; and most economists believe that the size of the anticipated business profits has something to do with the energy and shrewdness of the business man. It depends on our presupposition as to his motivation whether we consider his income above some wage standard as "earned" or as "rent" or "surplus."

And to the above assertion that external laws of nature prescribe the advantageous combinations of tools and labor, a "psycho-economist" might rejoin that these combinations are not to be taken for granted—they would never be realized but for human ingenuity, and that the currently accepted processes are in turn powerful institutions for molding the rising generation's ideas of natural law. It is true that invention, and the state and progress of the arts, are factors in wealth which the economist cannot help but take account of, and if he constructs any theory about them, it must be with the aid of psychological analysis. The "state of the arts" may for static purposes be assumed as an objective condition like the weather, but anyone who is inter-

ested in increasing social welfare and control over nature will not be content to stop there. He will ask how has progress in the arts been brought about in the past, and how can it be accelerated in the future? The patent monopoly system is based on a theory of inventive human nature; that men are more likely to contrive useful devices when they are assured of protection in reaping their benefits than when not. It was one of the projects Bentham thought most necessary for the improvement of human society.[1] Some modern theorists, with different presuppositions, class patent-monopoly gains as "unearned surplus" along with illegal monopoly gains. The question is, however, not solely what kind of motives actually control conduct, but partly, what kind of conduct controls the environmental factors most successfully.

It may even have seemed incorrect to speak of the "law of variable proportions" as a purely objective fact, so closely has it been connected in economics with the theory of value and the subjective elements thereof. The principle is referred to usually to show why the more abundant productive elements, of which more units would not make much difference in the output, inevitably have less value to the people who want the finished product than have the scarcer elements, of which more units would greatly increase the finished product. The laws of value are typical of that double dependence upon mental operations and physical conditions which characterizes so large a part of the subject-matter of economics. Altho scarcity of an object in the external world, relative to men's desires for it, is essential to its having economic value, yet such value is equally dependent on some one's wanting the object, and many of the actual phenomena of value are due to

[1] Jeremy Bentham, The Rationale of Reward (1830), p. 318.

differences in the intensity of wants which people have for different units of goods. The law of diminishing utility, a purely psychological postulate, giving greater precision to the tendency of exchange value of a commodity to decrease as the supply of the commodity is increased, has rendered very great service in economic analysis. If other equally regular principles could be discovered regarding the generation and mutations of the wants with which economic science starts, they might be equally useful, especially if we believe that a closer correspondence between actual consumers' wants and real needs is desirable.

When we proceed from utility to price, more psychology becomes necessary. Some further assumptions regarding the motives to competition and toward making provision for wants must be made. We usually assume the predominance of self-interest, so far as economic behavior is concerned; or we generalize that men strive to get the largest amount of material well-being for the least sacrifice; and of course we assume that men in general know their interests and the means of advancing them, in the existing state of the arts.[1] Wherever it appears that these conditions are not present, we make qualifications of the more general laws which do presuppose them.

There is one more group of subjects which illustrates the large part which presumptions as to motives play in economic investigations — the subjects of inheritance, monopoly profits, rents of natural agents, and differential gains of all kinds, with their related problems of taxation. Pure rent and monopoly gains are usually thought to be peculiarly fit objects of heavy taxation.

[1] See the discussion of premises in J. M. Keynes, Scope and Method of Economic Investigation, pp. 240–246; also chap. 4. The two assumptions just mentioned, along with the principle of diminishing utility, are considered the most important psychological postulates by the methodologists. Keynes mentions, however, a number of special problems where other psychical forces must be taken into account (pp. 129–134).

Why? Because the services for which they are paid are not the result of labor or saving on a competitive basis, and especially because heavy taxation will not lessen the supply of those services. The full amount which the traffic will bear need not necessarily be paid to the ownres of land or monopolies, in order that the community may get the fullest possible output. Herein seems to lie the vital distinction between such incomes and interest and wages. In dealing with the institution of inheritance, one of the chief questions is what rôle it occupies in inducing accumulation of wealth. The prospect of bestowing property upon one's descendants at his death is ordinarily supposed to be a strong motive for saving, and if estates were taken entire or taxed too heavily by the state, there would be less incentive to the owner to save, and more inducement to consume his property in his lifetime.

There is a third set of assumptions necessarily made by economic theory, not of physical or psychological laws, but of social facts having chiefly a mental origin; namely, the legal and social institutions, under which economic life is carried on. We must assume some kind of government which maintains order and enforces certain rules relating to property. What these rules are, may vary with different societies, and we may vary them in our hypotheses, with consequent variations in our conclusions. It is obvious that the production and distribution of wealth will take very different forms, according as distribution is on the basis of physical force, political competition, or economic competition under the institution of private property. The government, as Mill pointed out, might be considered a factor in production, since it is a labor-saving device. Hardly less pervasive in effect, through the " plane of competition " are the various customary codes of business and

professional ethics. All such institutions are human collective habits, based on unconscious custom or deliberate social will, and as we come to understand them better we are able consciously to modify them. The civil laws, of course, we are changing every day, and in the course of time the accumulation of such changes makes great differences in the economic situation. Custom and tradition are less amenable to voluntary refashioning, but "public opinion" can yet be influenced deliberately, by skilful appeal to popular sentiments.

Now, to consider the most probable effects on economic phenomena of the more plausible changes in governmental action, and in the other institutions which affect it, as well as conjectural changes in the arts, in population, and in the accumulation of capital, is the task of "dynamic theory" in economics.[1] The dynamic theory which considers institutional changes is obliged to pass some judgment as to the compatibility of such hypothetical innovations with human nature, of which more in detail later herein.

The foregoing, then, are some of the connections in which psychological postulates are used in economic theory. In this article we have not so far made any attempt to determine what are the most satisfactory psychological postulates in the various problems mentioned, nor have we attempted completeness of enumeration. The attempt was simply to make clear, by ample illustration, the point that many of the foundations of economic theory are secure against any possible fluctuations in the science of psychology; but nevertheless there are a number of the most important problems in theory which require psychological principles for their solution. We have thus tried to avoid the confusions

[1] See J. S. Mill, Principles, Bk. IV, chap. i; J. B. Clark, "The Future of Economic Theory," Quarterly Journal of Economics, vol. xiii, pp. 1–14 (1899), etc.

and errors which arise from any overestimation of either group of factors.

Another generalization may be hazarded. The psychology which is of use to economics is that which relates to the motives, or springs to human action.[1] In all the problems of theory we cited, the psychological assumptions were always as to what induces the human agent to work, to contrive, to save, to part with his goods. If we turn to the use of psychology in vocational economic fields, by the salesman, the advertiser, or the employment manager, we shall find it is the secret of arousing people to some kind of economic activity that is sought in each case. There are numerous technical problems subsidiary to motives, to be sure, with which the economist is concerned — the processes of choosing between one's wants, for instance, and of reasoning as to the means of satisfying those felt most urgently, or of arousing new wants in other people. But all these are included in the psychology of motives; and it is upon this psychology that we draw (from our own observations, or whatever other source) when we attack such problems as those in value and distribution which we have cited. Consequently it is only by adding significantly to our knowledge of motives that the psychologist can help us with our own theory; and here only so far as our explanations do imply certain incentives to economic conduct — not throughout the whole of economic theory.

Another useful preliminary will be a comparison of the terms "motive" and "cause." Since a motive may usually be described introspectively as an anticipation of a desired result, together with an apprehension of the causal sequence between some action in the agent's power and the desired end-effect, it seems that the

[1] Compare Professor Taussig, Principles, chap. 54.

future event in some sense *causes* the present action, and the ordinary temporal sequence between cause and effect is reversed. "Teleology" is apparently of a different order than "cause and effect," and in this distinction Professor Veblen has found an occasion for reading economics out of the ranks of the modern sciences. Its logic, he says, is that of "sufficient reason," and it has no room for the more pervasive law of causation.[1] This is to take what Professor Holt calls the "bead view" of causation, which has been discarded in physics — the view that cause and effect push one another along in fragments like marbles in a row.[2] The more accurate functional concept of causation is perfectly consistent with human purpose and foresight. The cause, in either case, is simply the object or process of which the other process (the human behavior) is some kind of constant (mathematical) function. The anticipated future satisfaction may be a part of the cause of today's labor, in that its realization is related to certain present signs which serve as the immediate stimulus to the laborer's activity. An unprejudiced view of motive, therefore, is the whole situation — that the man is prepared to execute some definite course of action with regard to some object or system of objects in his environment — his behavior is a function of that object.

An economic motive is one which results in behavior that affects wealth, or in economic activity; tho the wealth need not necessarily be the stimulus or even part of the stimulus. It is a commonplace, even in economic texts, that the economic motives are often very complex when one looks beyond the desire for wealth — we want a certain position not only for the larger salary, which will partly mean an easier time for our wife, but because

[1] T. Veblen, "The Limitations of Marginal Utility," Journal of Political Economy, vol. xvii, p. 623 (1909).

[2] E. B. Holt, The Freudian Wish (1915), pp. 157 ff.

we can live in the suburbs and appear to be getting on in the world and have Saturday afternoons off to play golf. Usually, possibly always, as economists we can safely shorten the expression and say "The man's motive is to make money"; but, as the writer hopes to show, the economist will gain numerous advantages from knowing as much as possible about the whole formula.

It is doubtless unnecessary to call attention here to the wider bearings which any real improvement of our knowledge of human nature has upon social welfare, altho it is hard to avoid being deceived by the abstract language of science into thinking of it as an "academic question." The economist, even tho he may have little taste for theory, will have no difficulty in visualizing behind the theoretical problems we have mentioned, such practical issues as tax systems, poor laws, judgments on trade policies, and all sorts of public regulations on business; such issues as state ownership of railroads or other means of production, and above all the old issue of collectivism or socialism. All these are argued partly upon rival theories of motivation, and in the question of socialism this element is especially large — what is constant and what is variable, and how is it variable, in human nature?[1] The competitive order is to be justified, if at all, upon the assumption that it provides the best stimulus to strenuous and economically directed efforts in that production of wealth which secures man's command over nature, at the same time providing the maximum of personal liberty. If that hypothesis is unsound, equal distribution must be the just one.

If we turn to the field of politics and government, we find questions of human nature as the inevitable legacy of Plato and his predecessors. Almost the chief problem

[1] See A. Wagner, Grundlegung der politischen Oekonomie, 3d ed. (1892), pp. 72 ff.

for schemes of international organization to keep the peace during the centuries has been — why do men fight? If we examine the fundamental differences of opinion in ethics and education, we shall find that most of them might be reconciled by an accurate knowledge of the original elements in motives, and the true principles of their development. At any rate, doubts would be removed as to the best *means* of increasing knowledge and moral or socially desirable behavior; while many of the apparent divergencies between the rival ultimate aims would probably disappear.

So far as psychology has really a place in economic theory, therefore, the results to which it leads us translate themselves into some of the gravest enterprises of life; and upon them the community does or should look to the economist for help. He is often despised, to be sure, as impractical, but he must comfort himself by the reflection that by investigations in "pure theory" time and effort are in the long run economized, because the undesirable results of some experiments which might be made in actual life (witness the Bolshevik laboratory) can be shown without the time and expense and misery of making the social experiment. It is about the same advantage that multiplication has over counting on the fingers — a short-cut through experiment.

The most severely practical man, of course, is a theorist, in that he constantly works with principles which he believes true without verifying them in every instance. The practical man, in deciding for himself what should be done about the railroads or some other problem, is guided by his working theory as to the general run of men's motives. If you ask him why he believes his own theory, he will say it is based on his own observation — he has not dealt with so many of his fellow-creatures for nothing. Doubtless there is much truth in this asser-

tion, but still, people do not realize how much the "common sense" of their time owes to the scholarly and advanced scientific views of a few generations before, which views are always, to a considerable extent, in harmony with everyday experience, but which are replaced by other philosophies that seem to account for still more of the facts. The conservation of matter and energy are common sense today, but in Priestley's time they were not. To a later generation the transmutation of elements may be common sense, founded on daily experience, as it was supposed to be in the days of the alchemists.

When we consider, then, the import which the real and elemental laws of human nature have (could they but be discovered) for our judgments and policies toward almost all our social institutions, we can better sympathize with the avidity with which both the lay and the scientific world seize upon any alleged discovery in psychology. The columns of stuff in the papers and magazines, and the somewhat more sober articles in the social science periodicals, applying in innumerable directions the teachings of James, McDougall, Freud, Binet and so on, are not to be ascribed merely to a fad. Many of them, no doubt, are improper applications of doctrines which in themselves are false; but such wide notice of these theories, purporting to explain human nature more accurately than had the philosophy or common sense of former generations, is perfectly justified by the great utility which more really accurate information on the subject would have.

We are concerned here with the importations of new psychology into economic theory. Our foregoing remarks as to the existence of a psychological content in theory and its implications are doubtless conceded to be true, if trite, but now we come to the real problems of

our paper. The issue is not, do we need *any* psychology, but do we need any *more* psychology, or any improvement on the psychology we are now using? "Some unsettled questions" are the following: Are the psychological assumptions which the prevailing economic theory makes sufficiently valid? Are they exemplified in the workings of real men's minds and in their choices; or, if not universally true, do they hold of a sufficiently large number of men to make them adequate for the economist's purposes? Or, if the assumptions now made are true as far as they go, can they be added to with profit to the science? More specifically, is there anything new in the science of psychology which necessitates, if true, any change in economic theory? If so, what is it and what changes does it imply? As was said at the beginning, many economists are unconvinced that such importations as have been made are necessary or useful.[1]

The course of the discussions on this point in economic literature is sufficiently well known so that the briefest chronological indication of it will be enough for present purposes. The German historical school began, soon after the middle of the nineteenth century, to dissent from the classical economists' assumption of self-interest in the pursuit of wealth as a general human characteristic, and they have gathered numerous adherents in other countries from that time to this. In the United States, after the marginal utility theory had been introduced, a discussion was started, apparently by President Hadley in 1894,[2] as to whether that theory, and perhaps

[1] See the vigorous review by A. C. Whitaker of Fetter's Economic Principles in Political Science Quarterly, vol. xxxi, pp. 430–444 (1916); and Professor Carver's brief article on "The Behavioristic Man" already cited; also citations of opinions that psychologising is unnecessary for the economist in W. C. Mitchell's "Human Behavior and Economics," Quarterly Journal of Economics, November, 1914.

[2] A. T. Hadley, "Recent Tendencies in Economic Literature," Yale Review, November, 1894; H. W. Stuart, "The Hedonistic Interpretation of Subjective Value," Journal of Political Economy, vol. iv, pp. 64–84 (1895); Veblen, articles cited in next reference; Davenport, Value and Distribution (1908), and others.

the whole of economic theory, did not need considerable qualification or change of view, on account of the doubtful validity of its hedonistic psychological assumptions. Professor Veblen, in the later '90's and in subsequent years called the established body of economic science such names as "taxonomic" and "non-evolutionary" because of its alleged hedonistic psychology and teleological philosophy,[1] and he has during that time been demonstrating how "evolutionary" or "genetic" economics should be written.[2] In 1910 Professor W. C. Mitchell joined the attack on Veblen's lines, armed with the eminent English psychologist McDougall's dictum that "it would be a libel, not altogether devoid of truth, to say that the classical political economy was a tissue of false conclusions drawn from false psychological assumptions."[3] More recently there have been suggestions toward revamping economic theory by means of certain modern psychological principles from Professors Hobson, C. H. Parker, W. F. Ogburn, B. M. Anderson, Jr., C. H. Cooley, J. M. Clark, W. H. Hamilton and others. Professor Taussig[4] and some other eminent American theorists have recognized the important part which the psychology of instinct may play in certain economic phenomena — particularly in the contentment of industrial workers — but they have not seen that the cur-

[1] Thorstein Veblen, "Why Economics is not an Evolutionary Science," Quarterly Journal of Economics, vol. xii, pp. 373–397 (1898); "The Preconceptions of Economic Science," Quarterly Journal of Economics, vol. xiii, pp. 121–150, 396–426 (1899), and vol. xiv, pp. 240–269 (1900); "The Limitations of Marginal Utility," Journal of Political Economy, vol. xvii, pp. 620–636 (1909).

[2] Theory of the Leisure Class (1899); Theory of Business Enterprise (1904); Instinct of Workmanship (1913), etc.

[3] Quotation is from W. McDougall, Introduction to Social Psychology, 12th ed., p. 11 (1st ed. about 1908). Professor Mitchell's article was "The Rationality of Economic Activity," Journal of Political Economy, vol. xviii, pp. 97–113; 197–216 (1910). He has since written several articles on realistic psychology for economists. See his "Human Behavior and Economics: A Survey of Recent Literature," Quarterly Journal of Economics, vol. xxix, pp. 1–47 (1914), and "The Rôle of Money in Economic Theory," Proceedings of the American Economic Association (1915), pp. 140–161.

[4] Inventors and Moneymakers, 1915.

rent economic theory needed revision in the light of it. A number of still other writers, including Professor Marshall, have gradually changed their phraseology as to utility so as to avoid the implication of a hedonistic account of motivation.[1] Professor Fetter has done this with quite an air of reform, but neither he nor the others of this latter group have made any substantial change in the economic analysis as a result. The prevailing attitude seems to be that so far, no results of psychological research have been brought into economic discussion which call for any radical revision of theory; and therefore we will use our accepted psychological postulates, which are abundantly verified by everyday observation, until the psychologist brings forth in convincing fashion some revision of them which will make a real difference in our theory.

In order to determine whether this conclusion is correct, or whether it ends the matter until a properly accredited psychologist appears with some more significant discovery, it is necessary to make an analytical examination of the general drift of the main criticisms and of the replies which affirm that no revision of economic theory is needed. The present writer believes that grounds will be shown for a further inquiry into the psychology of motives in the interests of economics, and perhaps some irrelevant points of the criticism can be eliminated from further discussion. The criticisms (and replies to them) fall into about six counts, five of which are based on relatively "new" psychology.

1. *The Hedonistic Foundation.* — The first point of criticism is that the hedonistic conception of "utility," the assumption that pursuit of pleasure and avoidance of pain are men's fundamental motives, and the ac-

[1] See citations of changes in Mitchell's article, "The Rôle of Money in Economic Theory" above referred to.

companying presupposition that men customarily reason out the means available to them for securing pleasure and act so as to get the maximum of it, must all be thrown into the discard, because of the doom pronounced on them by psychology; and consequently economists should get a better psychological content to put into their place. On this point the critics have been agreed, tho they have gone on to very different points of reconstruction. Psychological hedonism has been under the fire of ethical writers for centuries, but the way its "explosion" came about in the science of psychology seems to have been about as follows: The instincts, animal and human, had long been studied and admired, but psychologists considered them unimportant in adult life until about the last quarter of the nineteenth century. Then several psychologists and biologists, notably William James and Jacques Loeb, began to attach much greater significance to these unlearned acts and reflexes as keys to psychological explanation. They also noticed the mechanical and automatic character of habit, and its pervasiveness in all human and animal conduct. By 1890 James is publishing his great *Principles of Psychology*, wherein he discourses on the number and characteristics of the instincts he believes men to use throughout life, and on the similar mechanisms of habit. The neural basis of "ideomotor action" is a little vague, but here, he thinks, is another source of spontaneous, unreflective actions. And so, in his chapter on the Will, after admitting the usual force of agreeableness and disagreeableness in promoting behavior, he says:

> So widespread and searching is this influence of pleasures and pains upon our movements that a premature philosophy has decided that these are our only spurs to action, and that wherever they seem to be absent, it is only because they are so far on among the "remoter" images that prompt the action that they are overlooked.
>
> This is a great mistake, however. Important as is the influence of pleasures and pains upon our movements, they are far from being

our only stimuli. With the manifestations of instinct and emotional expression, for example, they have absolutely nothing to do. Who smiles for the pleasure of smiling, or frowns for the pleasure of the frown? Who blushes to escape the discomfort of not blushing? Or who in anger, grief, or fear is actuated to the movements which he makes by the pleasures which they yield? In all these cases the movements are discharged fatally by the *vis a tergo* which the stimulus exerts upon a nervous system framed to respond in just that way. The objects of our rage, love, or terror, the occasions of our tears and smiles, whether they be present to our senses, or whether they be merely represented in idea, have this peculiar sort of impulsive power. The *impulsive quality* of mental states is an attribute behind which we cannot go. Some states of mind have more of it than others, some have it in this direction and some in that. Feelings of pleasure and pain have it, and perceptions and imaginations of fact have it, but neither have it exclusively or peculiarly. . . .

If in these our *first* acts pleasures and pains bear no part, as little do they bear in our last acts, or those artificially acquired performances which have become habitual. All the daily routine of life, our dressing and undressing, the coming and going from our work or carrying through of its various operations, is utterly without mental reference to pleasure and pain, except under rarely realized conditions. It is ideo-motor action. As I do not breathe for the pleasure of the breathing, but simply find that I *am* breathing, so I do not write for the pleasure of the writing, but simply because I have once begun, and being in a state of intellectual excitement which keeps venting itself in that way, find that I *am* writing still. . . .

Or what shall be said of a shy and unsociable man who receives point-blank an invitation to a small party? The thing is to him an abomination; but your presence exerts a compulsion on him, he can think of no excuse, and so says yes, cursing himself the while for what he does.[1]

No account need be given here of the development of these doctrines at the hands of McDougall, Thorndike, and others, for James's conception of instincts, emotions, habits as the prime movers to action, distinguishes the "functional psychology" which was the scientific basis of the economic critics' repudiation of hedonism. It is true that present-day psychologists do not use

[1] Principles of Psychology, 1890, vol. ii, chap. xxvi. Quotations made from the Briefer Course, pp. 445–447. As to the divorce of habit from pleasure-pain motivation, the same point is made by J. S. Mill, e. g., Logic, Bk. VI, chap. ii, § 4.

"pleasure" and "pain" in the inclusive sense of the older writers, since pain is now restricted to a definite sensation, coördinate with touch, taste, etc.; but the modern "feeling-tones" of pleasantness or unpleasantness, which coexist with most sensations, may be substituted without confusion for the older terms of pleasure and pain in discussions of motivation theory.

Now if instincts and habits cause human action in this unpremeditated way, and if the instincts are as various, and habit (or custom, fashion, etc.) are as omnipresent as these new psychologists represented, the critics reasoned, then it follows that man is not typically the rational being, acting for anticipated pleasant ends, that we had supposed him, and economic theory is seen to take a very incomplete view of the real process of economic behavior. This basis of criticism fitted in admirably with the agnostic views on business enterprise and consumption to which Professor Veblen had come from other angles, and so, by identifying the economist's concept of utility, sometimes with the consumer's personal "sensuous" gratifications, and sometimes with a broad social view of utility, he was enabled to argue in downright fashion that modern industrial activity, and especially business profits, bear little relation to the ultimate utilities which are being produced.[1]

Another objection to the hedonistic theory of motivation, which has been made by moralists from time immemorial, is based on the acknowledged existence of

[1] E. g., "The hedonistically presumed final purchase of consumable goods is habitually not contemplated in the pursuit of business enterprise. Business men habitually aspire to accumulate wealth in excess of the limits of practicable consumption, and the wealth so accumulated is not intended to be converted by a final transaction of purchase into consumable goods or sensations of consumption. . . . If, in fact, all the conventional relations and principles of pecuniary intercourse were subject to such a perpetually rationalised, calculating revision, so that each article of usage, appreciation, or procedure must approve itself *de novo* on hedonist grounds of sensuous expediency to all concerned at every move, it is not conceivable that the institutional fabric would last over night." Veblen, "The Limitations of Marginal Utility," Journal of Political Economy, vol. xvii, pp. 634, 636.

altruistic motives, in which the interests of other people than the agent, or the furtherance of some abstract ideal, are sought at the cost of the agent's own happiness. Economists are always reproached for their assumption of self-interest. But such objections are against the theory of universal egoism, not against universal psychological hedonism, and the two theories call for very different analyses. The man who sells all his goods to give to the poor may do so for the sake of the greater satisfaction or pleasure he obtains from doing it than he would from not doing it; or he may act in the same way impulsively, without the least thought as to how it will make him feel. What the external and social effects are, of egoism as compared with altruism, or the intermediate gradations, are of course open to non-psychological investigation. As Professor Carver says, there is little doubt whether the complete egoist or the partial egoist makes the better father and citizen,[1] but if we decided that we wanted to change people's motives in any respect, it would be useful to know something about the instincts or means of attachment of pleasure which make them act as they do.

The earlier attacks of the historical school on classical economics had been on the ground that the latter assumed a too universally selfish pursuit of wealth; their researches having shown that under other social institutions, other motives were stronger than this one is in modern commercial nations. This objection may best be considered later with another group relating to the effects of institutions.

The first effect of the psychological reaction against hedonism, above described, upon economic theory was criticism of the marginal utility theory of value.[2] Jevons

[1] Essays in Social Justice, chap. iii (1914); Principles of Political Economy, chap. iii (1918).

[2] See Hadley, op. cit.; Stuart, op. cit., etc.

had rubbed in the hedonistic calculus in his presentation of the value theory, and the Austrians and other adherents of the theory spoke, as a matter of course, of the "pleasures" and "satisfactions" which valuable goods mean. Nice calculations of small quantities of utility or pleasure also seemed rather essential to the theory. Hadley's qualification to these assumptions was based more on his own observations as to the number of unreflective, customary acts in every-day life than on new psychology, but the functional psychology increased the doubts as to the generality with which deliberate and careful valuations are made, such as the marginal utility theory seems to call for. The heroic lengths to which the search for improved psychology to sustain economic explanation could go, is illustrated by Professor Whitaker, who relates that an enthusiast seriously argued to him that the motor-car manufacturer puts stronger and softer springs on his machines, not because of the expected utilities to the consumers, but for the sake of his "entrepreneurial self-realization." [1]

It was easy to answer the objections at this stage, and to show the independence of value or other economic theories from any assumption that men merely seek pleasure and try to avoid pain. All we assume is that men want *goods*, concrete objects and services. There is no doubt about that; and we simply take whatever wants may happen to exist, as our motivation premises. Very likely people want shotguns because of their hunting instincts, and prayer rugs because of their superstitious customs, etc.; but whatever their wants are, some kind of material means, or wealth, are required to satisfy them. Likewise we observe that people learn what are the means for encompassing their desires; and,

[1] Op. cit., p. 430. Marion Parris in a Byrn Mawr thesis, "Total Utility and the Economic Judgment" (1909) criticises the psychology of economic theory from the self-realisation point of view.

whatever the mental operations involved, they certainly do choose among their limited means so as to satisfy their most urgent wants. The ends may be instinctive or arbitrary, but the means are sought intelligently, economically. In the case of mechanically habitual acts, there was some deliberation at the time the habits were formed, and hence these were based originally upon preference among alternative courses. If the habits come to be unsuitable, through changes in the situation, and give strikingly uneconomic results, the agent is aroused to renewed deliberation and assertion of choice. Our theory is not dependent on any particular degree of rationality in the choices, nor on any special wisdom in the desires. Our "utilities" are not confined to sensuous satisfactions, nor yet to the wants which are ideal from the social point of view. The utilitarian psychologists and the classical economists never limited "pleasure" to sensuous personal bodily pleasure. All things which are in fact by mortals desired were considered pleasures by them, and their lists of desires read marvelously like the modern lists of instincts. The wants connected with ostentation, which Veblen has so well characterized, are amenable to our theorizing — in fact the critics themselves seem to consider these desires as among the strongest motives in the pursuit of wealth. As to rationality, we know that people usually are capable of following cause and effect in business far enough to see where they can get the most pay for what they have to sell. The kind of rationality which the critics accuse us of assuming is a complete knowledge of all facts in the universe, to which we plead not guilty.

As to our general theory of motivation, the reply goes on, all that economists ever needed to say is that most men try to get the largest possible amount of *wealth* for

east cost, which assumption is borne out by obser-
on, and has not been shaken by anything we have
d from psychology. No doubt some economists
: said that men desire happiness or pleasure, but
t we really presume is that men want wealth, which
e generalized means of realizing what wants as con-
ers they may have. In general, with regard to the
ifications of our assumptions necessitated by mo-
: which do not express themselves in wealth-seeking,
y defects of knowledge of people's own interests,
these qualifications are usually such as cannot be
ced to any general principles, and the undue
asis of them simply leads to agnosticism.
ierefore, say the defenders, the old, and rather con-
nt, hedonistic phraseology may be dropped from
omics without impairing the validity of our anal-
The present writer believes that modern psy-
gical work, especially upon the "conditioned
t," tends largely to validate the associationist and
lonist" psychology, as well as to enlarge it; but
is a consideration beyond the scope of this paper.

Costless Production. — But these doubts reach
er than the theory of value. They affect all prob-
of economic theory where principles of motiva-
are involved, especially those of distribution. The
ine of motivation implicit in the classical and
rn economics is that men in general seek the

e Böhm-Bawerk, Positive Theorie des Kapitales, 3d ed. (1912), 2d half-volume,
-330, who answers the criticisms on value theory in this fashion; also Whitaker,
and Davenport, op. cit., who argue about as stated above. Marshall, Principles,
hap. ii, explains the economist's treatment of motives similarly.
t authors of economic principles, to be sure, do feel called on to give some ac-
r analysis of the various human wants or motives, especially Continental writers.
strian Cubel in 1907 published a fair-sized volume devoted to such classifications,
ng, as usual, that the ultimate force of wants is in the feelings of pain and plea-
Die Lehre von den Bedürfnissen, Theoretische Untersuchung über das Grens-
ler Oekonomik und der Psychologie, Innsbruck, 1907, 310 pp.) Wagner's long
of economic human nature is still one of the best in any scientific treatise (op.
. I, Pt. I, pp. 70–136).

largest material gain for the least sacrifice, and that their knowledge of ways and means is such that, on the whole, in competitive activity they do accomplish what they seek. Labor is irksome, and this irksomeness can be overcome only by threats or rewards. If it should turn out, however, that men are pushed into productive activity from behind, by their nature, fully as much as they are lured from the front by their pay, then our economic explanations lose considerable of their cogency as well as much of their accuracy.

The critics could admit most of the foregoing reply, and still maintain that the fall of hedonism necessitates substantial readjustments in economics. The next point of criticism accordingly is that men want, not only goods, but activity. Work itself is a utility to them. So that economics, in reasoning that production hangs on the wants for goods, is again telling no more than a half-truth. The power of instincts and custom, or public opinion, should be utilized for inducing production and saving at less cost to society. Inequality of wealth can thus be mitigated by the prevention of the large prizes from piling up on people who have already more than they need. Inventors, artists, patriots, leaders of industry would do their best work, even if they received only comfortable living wages; it is in their nature to put forth ceaseless activity in those directions, because their springs of action "are wound up that way."[1] How absurd, then, to let them accumulate and dissipate big fortunes, because of their luck in possessing aptitudes which are worth so much to their fellow-men. Even the multitude of us, who do not have such full and free creative bent, do a great many things in which we have no pleasure or even would gladly avoid, just be-

[1] See Taussig, Inventors and Moneymakers, for a statement, tho not a defense, of this theory.

cause we don't want to seem "queer." We could be kept doing our best by public opinion and our own sense of good will, without being paid according to the pieces of work we turn out. Most of our capital, in modern times, is accumulated automatically, both by rich and poor, without conscious reference to the rate of interest. Hence modern psychology points the way to means of stopping the "rent" or "surplus" of natural ability or involuntary saving from going to people who do not require it to induce their contributions of services.[1] Such suggestions, of course, are common among socialists.

The reply is that *part* of the supply society wants, either of work or of saving, would doubtless be forthcoming if there were less reward than at present, or none at all; but not the whole amount would be had. It is true that some fish are caught and some chopping of wood done, just for the "fun" of the occupations; and much other production could be motivated by less reward than the producers get now. But the output of these enthusiasts would not go far toward supplying the whole community; in order to get the full amount desired, it is necessary to pay all producers or all savers the rate which we have to pay the most reluctant one. The most effective way we know to increase our stock of wheat or coal or pork, even in war-time, or to get loans to finance the war, is to offer a higher price for all units of the supply, tho that means abnormal gains to some producers. As to taking such differential gains by taxation, we can do that when the differences are due to differing expenses of production; but where the differences are in personal ability or diligence, it is impracti-

[1] Substantially this is the argument of J. A. Hobson, Work and Wealth: A Human Valuation (1914). Other theorists who believe capital is accumulated automatically do not usually draw the above inference, but it is inevitable. See Taussig, review of Kleene's Profit and Wages, Quarterly Journal of Economics, August, 1917.

cable if not unjust to bribe the unworldly performer less than the grasping one.[1]

Another line of reply is that if you subsidized these various artists with a comfortable living regardless of their products there would be no assurance that they would devote their talents to works that other people most wanted. When their subsistence depends on the salability of their products the resulting activity may be distasteful to the artists but it is more certain to satisfy the wants of a number of their fellow-beings.

3. *Industrial Peace.* — A recent variation in the application of the instinct psychology to economics, one which brings to bear the Freudian teachings, is the warning that economists should consider the effect of forms of industry upon the workers' fundamental instincts. When the work stifles these instincts and baffles their free expression, as for instance the specialized routine of semi-automatic machines defeats the attendants' creative bent, then the baffled impulses force their expression in violent outbursts, inattention, rebelliousness, sabotage. Workaday tasks may thus be the causes of innumerable nervous afflictions such as Freud has studied, leading to various forms of mania. It was contended that the waves of strikes and industrial unrest in the years 1915 and 1916 might be accounted for along these lines. If economists acquainted themselves with the nature of the important human instincts, therefore, they could give better advice on labor problems.[2] In similar fashion, other elements in the economic situation

[1] See Professor T. N. Carver, "The Behavioristic Man," Quarterly Journal of Economics, vol. xxxiii, pp. 195–199 (1918); and "The Place of Abstinence in the Theory of Interest," ibid., vol. viii, pp. 40–61 (1893); also Professor J. M. Clark, "Hobson's Work and Wealth," review, Quarterly Journal of Economics, November, 1914. Marshall, Principles (6th ed.) Bk. IV, chap. iii, §§ 5 and 6, notes the existence of surplus to certain savers and laborers.

[2] See Carleton H. Parker, "Motives in Economic Life," Proceedings of American Economic Association, 1917, pp. 212–231.

might be considered as to their effects on people's instincts, in an estimate of their contribution to human welfare.

The answer is that such investigations are doubtless important, but they fall only to a very limited extent within the scope of economic theory. Economics must not be confused with the whole of social science and art, and as to the recent industrial unrest, we may believe that rising prices had a good deal to do with it.[1] Economists hardly need to be told now that there is no one specifically economic motive, and that the relations of employers and laborers are concerned with many other human factors than the rate of wages, but it is believed that this is a special phase of economic investigation which must be studied empirically.[2] The connection of the psychology of instincts with these problems, however, has been given attention by two of the most eminent American economists, outside their general treatises [3] and the presentation of it to the business and labor world is assured by students of labor problems.[4] Another prominent economist has published his own theory of the psychology of instinct and emotion, with side-views at the Freudian doctrines, without as yet drawing any social applications.[5]

Provided the instinct theories on which these labor welfare views are based hold their own in the psychological world, there is every reason to believe that a large and useful body of knowledge will arise, which may in

[1] Fetter, Discussion of Parker's paper, Proceedings of American Economic Association, 1917, pp. 231 ff.

[2] E. g., Keynes, op. cit., chap. iv, § 3, and R. F. Hoxie's Trade Unionism in the United States, reviewed by Ordway Tead, Journal of Political Economy, vol. xxvi, p. 763 (1918).

[3] F. W. Taussig, Inventors and Moneymakers (1915); Irving Fisher, "Health and War," Presidential Address, American Association for Labor Legislation, 1918.

[4] See the recent book by Ordway Tead, Instincts in Industry (1918), which was inspired by Professor Parker's teachings.

[5] Simon N. Patten, "The Mechanism of Mind," Annals of American Academy of Political and Social Science, vol. lxxi, pp. 202–215 (May, 1917).

time find its place in economic theory. It is in too nebulous a state to do so now.

4. *Sums of utility misleading.* — Another criticism of the current economic theory from a psychological standpoint, which is not based especially upon new discoveries, is an accusation that many of the current statements of the marginal utility value theory are inconsistent with the psychology presupposed by that theory. We refer to the expositions relating to sums of utility, and the transition from individual utility scales to general demand schedules. Upon the principle of diminishing utility, the contemporary inequality of incomes among different people makes it impossible to assume that equal money demands in the market for commodities represent equal utilities to the various people who are demanding. Five dollars offered by a millionaire for a poodle's collar does not approach the utility of five dollars worth of flour to a laborer. So long as the discussions are confined to subjective *utility* schedules, or to general money *demand* schedules, the value theory is satisfactory to this critic; but when the notion is smuggled in that the dollars in the general demand schedules represent equal marginal increments of utility, and the inference is suggested that the present competitive system directs productive agents into making the goods which have greatest utility to the whole community, the critic does strenuously object. If incomes were equal, production would be turned away from collars for poodles and private yachts, and the multitude of expensive luxuries, toward things which have greater utility to poorer people. Cultivation by economists of realistic psychology would cause them to avoid any degree of speaking in such fashion.[1]

[1] See B. M. Anderson, Jr., and the writers he mentions: Social Value (1911), esp. chap. 5, and The Value of Money (1917). Cf. P. G. Wright, "Total Utility and Consumers' Surplus under Varying Conditions of the Distribution of Income," Quarterly Journal of Economics, vol. xxxi, pp. 307–318 (1917).

It is admitted that differences of wealth do, indeed, prevent us from arguing that competitive distribution necessarily gives maximum satisfaction,[1] but, since usually money events affect the various social classes in about equal proportions, a general correlation between dollars and utilities may be assumed. And, looking beyond the mere satisfaction of consumption to the motivation which it involves, we may find that the poodle's collar induces more productive effort for society in general than does the barrel of flour in the poor man's home. If it happened that a great manufacturer wanted an expensive and nearly useless summer home, and, if he could not have it, would rest on his oars instead of scheming how to make motor cars or shoes cheaper, the community as a whole may derive great utility from that summer house, through the services it motivates.

5. *Social Character of Demand.* — Returning to criticisms based upon non-hedonistic psychology, we find a line of social psychology criticism. This has its roots in the phenomena of instinct and habit, above alluded to; for tho the name "social psychology" embraces many wonderful doctrines, the chief terms of their explanations are inborn propensities and the power of custom to influence individual action. Imitation, suggestion, tradition, fashion, sympathy, emulation and the like are the entities we meet, and they are classified and pedigreed according to the author's apprehension of the fundamental tendencies. By means of these original or instinctive structures in the individual's mental apparatus, the psychic lives of all members of a society interact and mutually determine one another. The principles so worked out by social psychologists are used in this case to account for the stability and inertia

[1] E. g., Marshall, Principles (6th ed.), Bk. V, chap. xiii, § 5. Cf. ibid., Bk. I, chap. ii, § 3; and Bk. III, chap. vi, § 3.

of economic demands, and more particularly to make the point that demands are instilled into the single person by the group of people whose lives in any way touch his. Demands for economic goods are instilled partly through the moral, legal or aesthetic "values," which are swayed, in any individual, by the whole thought of his group. The extent of rational action by the individual, with reference to the actual effect of material goods upon his personal welfare may also be discounted on the same grounds. The supposition that the individual best knows his own interests, and the means of realising them, tends to be discarded. Sometimes the assertion is made that a man's choices and behavior are entirely at the mercy of the social and material environment into which he happens to be born.[1]

The criticism is then made that the prevailing economic theory is based on a monadistic psychology; each consumer developing his own wants independently, and carrying them about in a suggestion-proof container; and it therefore considers social phenomena as the mere summation of individual choices. But the single person's choices are so swayed, even in the marketplace, by suggestion, by what he thinks other people want, that we must consider market value to be a social choice; the value set upon goods by the whole interacting social mind. This conception is supposed to account for sudden variations in objective or market

[1] "Scientific knowledge of mental and physical health . . . is undermining the idea that each individual is the best judge of his own desires . . . [the individual] can make nothing out of the world that the world does not first make out of him; he cannot even desire of the world, save as it has taught him to desire. He is limited by the range of stimuli that have come within his experience. He is at the mercy of whatever system he happens to be born into for creating, transmitting and directing stimuli. The slum tenement, the hill farm, the school, the church, the newspaper, the advertisement . . . all are parts of this system which determines men by determining the stimuli to which they are exposed." J. M. Clark, "Economics and Modern Psychology," Journal of Political Economy, vol. xxvi, pp. 6, 11 (1918). Professor B. M. Anderson also teaches that "the individual" is a misleading conception, since he is so largely a social product. The writings of Professor C. H. Cooley on social psychology have been very influential in impressing this point on a group of American economists.

values, in panics, booms, fashion epochs, which are incomprehensible in terms of the little units each calculating private utilities.[1]

Moreover, it is said, since the influence of deliberate suggestion is so strong in molding demands (witness the various businesses of promotion, salesmanship and advertising), economics needs a "theory of economic guidance," or of direction of wants, showing how actual wants may be made to coincide with real social needs.[2] Of course such a theory of guidance must be based on the best attainable social psychology.

The reply to this line of criticism is that such social influences affect economic values and behavior, only through the objective choices of individuals, and they are thereby brought within the range of ordinary value theory.[3] Suggestibility may be a powerful agent in determining choice; tho doubtless much of the so-called suggestion is merely enlightenment as to opportunities for securing satisfactions. No one doubts that choice depends upon knowledge of the means of getting utilities. It is questioned if the mature person's wants (which are those affecting economic matters) are as much the prey of suggestion, or if the ordinary man is as much of a jellyfish, as the critics make out. As to the guidance of wants, religious and moral leaders have always made that their business, and they will undoubtedly use the best psychological light they can get.

6. *Institutional Economics.* — We are now better able to appreciate the nature of Professor Veblen's criticism, made twenty years ago and repeated at inter-

[1] B. M. Anderson, Jr., books cited, and "Price-Fixing and War Finance," Proceedings of the American Economic Association, 1917, pp. 240–242.

[2] The second, or constructive, part of Professor J. M. Clark's paper cited above, on "Economics and Modern Psychology," outlines a "theory of economic guidance." Journal of Political Economy, vol. xxvi, pp. 136–166.

[3] See R. B. Perry, "Economic Value and Moral Value," Quarterly Journal of Economics, May, 1916.

vals since, that economics is "non-evolutionary" and "taxonomic"; and also the more modern demand for an "institutional economics." Veblen's arguments are never easy to follow: these on genetic economic theory seem to be among his most obscure. And the papers of Professor W. C. Mitchell,[1] making much the same arguments, tho clearer, are not generally well understood. Since the preliminary step of this line of objections is to accuse current economic theory of hedonism, the latter's defenders have considered themselves done when they proved their independence, by showing that they assume only the facts of choice, and care nothing as to why the choices are made.

Veblen admits, however, the effectiveness of the current theory for most of the purposes to which it is so far put. What he says to us in effect is this:[2] You are doing fairly well what you undertake to do, in spite of your bad psychology, but you are not undertaking enough. Your theory shows how whatever choices happen to exist, work themselves out in the modern business world, taking all its conventions and arts for granted. The hedonistic manner of calculating utilities happens to be much the same as the business style of calculating profits, especially in the processes of production (tho the scheme has little exemplification in consumption), and so you have not gone so far wrong as you might have in a science of business.

But with your old hedonistic preconceptions you will never get any further than things as you find them. Any predictions you make as to the effects on economic phenomena of certain arbitrarily supposed states of the arts or social or governmental conditions (for example,

[1] Especially "The Rationality of Economic Activity," Journal of Political Economy, vol. xviii, pp. 97–113, 197–216 (1910).

[2] See his three articles cited above: "Preconceptions," "Economics not an Evolutionary Science" and "Limitations of Marginal Utility."

different institutions as to property), are well-nigh worthless because you suppose men primitively and intrinsically to be the shrewd and rational economizers that you find in the modern down-town office. Your conjectural history of savages swapping nuts and apples according to marginal utility calculations, and your expositions of economic principles in terms of psychic income, are the fruits of this delusion. If you had cultivated better psychology and anthropology, you would know that people's decisions are not determined, except within very wide limits, by considerations of the primitive or absolute pleasure pain utilities, or by unbiased reasoning as to the properties of external goods in relation to men's wants. The "facts of choice" at any time depend chiefly upon men's native instincts interplaying with the great body of customs and current technology and common-sense philosophy that have been handed down to them; above all by the kind of prowess held in most esteem. The very capacity for reasoning and calculating in economic affairs, which you suppose to be innate, is the product of the more refined perceptions of economic cause and effect that are made possible by the use of money.

You admit that our constant associations with money values in business life cause us generally to think obviously expensive things more beautiful than inexpensive things, and to pay more respect to wealthy neighbors than to poor ones. We are constantly buying things we don't need because we find them going at a bargain. Yet you fail to see how manifold are the other ways that our culture colors and directs our ways of thinking. The technical processes you see about you, the government and business usages now in vogue, came about in some way that you leave to others to explain, and into them you fit your cunning welfare-desiring

savage. And you suppose that into any future society, under other laws, *mores* and arts of workmanship, the men of that time would bring the same processes of valuation, the same enthusiasms and utilities, the same standards of what is reasonable and efficient and worth while that the men of today possess.

The upshot of it all is that your help in guiding the community's economic affairs will never begin to realise its possibilities until you reach a more complete understanding of economic activity; which understanding must include a knowledge, derived partly from modern psychology and anthropology, of how institutions and the basic instincts mold the industrial routine, and how the latter becomes in its turn an institution which helps to mold the mind of the rising generation. This is the cumulative sequence or evolution in economics, comparable to the evolution which other modern sciences study in their fields.[1]

In some respects, the historical school's criticism of classical economics was in this same vein — alleging an underestimation of the force of custom, convention and other motives beside that of making the most money for the least effort. Knies said that universal altruism was as valid an hypothesis as universal egoism; and Frederic Harrison in England reminded the classicists that

> In vast permanent societies in long ages of history, populations such as the Egyptian and Indian, under a strict caste system have shewn an astonishing degree of industry, directly stimulated by habit, social feeling and religious duty; and in a very slight degree by personal desire of gain. In religious societies, under very different kinds of faith, very active industry on a scale quite decisive as an experiment has been stimulated by purely religious motives. Some of the most splendid results of industry ever recorded — the

[1] Professor W. H. Hamilton has also argued that theory should take this turn. See his "The Price System and Social Policy," and "The Place of Value Theory in Economics," Journal of Political Economy, vol. xxvi, pp. 31–68, 395–400 (1918). Professor J. M. Clark's article above quoted leans in the same direction. W. Sombart's work is a partly theoretical account of the evolution of capitalism.

clearing of wildernesses; vast public works such as bridges, monuments and temples; the training of whole races of savages into habits of toil — have been accomplished by purely religious motives by monks, missionaries and priests.[1]

Opposed to such persuasions is the contention (substantially that made by Mill) that our great aim at present is to analyze the economic order we are now living in, with human nature as we know it. This task is sufficient to occupy us for some time, and it is more important than is worrying about what primitive man may or may not have done.[2] Whoever understands the economic forces at work in our own day will not have difficulty in deciphering those in other forms of society. Our assumptions, of men's efforts to get the greatest wealth for the least sacrifice, rationality in the application of means to this end, diminishing utility, etc., are sufficiently true of the general run of people in the modern states; and we have not had to wait on the development of the whole formula of economic progress before being able to give quite helpful advice upon such things as railroad rates, the currency and the tariff. That ambitious enterprise, the complete theory of economic development, will come when more is known about the whole process of social development; our present theory will undoubtedly fit into it quite as well as Veblen's demonstrations of genetic economics.

It is further urged, on the other hand, that the current theory is already an evolutionary theory, since the long-run survival of a nation depends upon its material progress, and since economic science throws light on the

[1] Quoted in Keynes, op. cit., note, pp. 133, 134.

Another Lewis Carroll might, indeed, work out a system of economics based on the assumption of universal and complete altruism, exhibiting the "trust" as a benevolent institution for relieving unfortunates of the root of all evil, and representing bargaining as a process of accommodating the other fellow by taking off his hands the care of his possessions.

[2] J. S. Mill, Logic, Bk. V, chap. ix, § 3; T. N. Carver, Distribution of Wealth, Introduction; J. M. Keynes, op. cit., pp. 166 ff.

most reasonable and efficient use of limited natural resources. It does not matter so much what any people's actual instincts or wants are, as that they manage to control their impulses, and act more efficiently than their competitors. Reasonableness is a great weapon of survival, in the natural selection of peoples. Granted that large societies have existed at various times, built on religious or customary motives, where are those societies now? They are not inheriting the world as are the peoples who have adopted the system of competitive liberalism. Rationality may be partly a product of social evolution, but from this time on, any group that tries irrational variations will do it at their peril.[1] The same sort of reasoning vindicates the assumption of moderate self-preference in the pursuit of wealth, aside from the overwhelming testimony of observation that in business dealings practically all men do want to make as much money as they can.

So much for the main lines of criticism on psychological grounds. The plausibility of the replies shows at once that psychologizing is not so imperative for the economist as it is sometimes represented. The hedonistic explanations which were formerly used by the classicists, and by nearly all economists until recently, are seen to be unessential to the economic theories they were supposed to have supported, and they have been dropped from recent writings, without damage to the economic doctrines themselves — at least in their static aspects. We can take as our ultimate data on the side of demand the "facts of choice," which account for the values of different goods, and assume through our own societies a universal moderate degree of self-preference in the accumulation of wealth (which, on account of its

[1] See Carver, "The Behavioristic Man," cited above. Cf. Walter Bagehot, "Preliminaries of Political Economy," in Economic Studies, p. 80 (1880).

interchangeability, satisfies the most diverse instincts and habits), and we need not inquire further into the psychological principles which determine that the choices shall be what they are. The pleasure and pain phrases were perhaps consciously used by the older writers just for purposes of convenient exposition, not for premises of investigation; in any case, the supposedly "first principles" of any science are likely to be less secure than its body of more particular propositions, because the former are usually formulated long after the latter.

Nevertheless the psychology of motivation may with advantage be cultivated by economists for the following reasons:

Altho the *process* of valuation which the marginal utility theory describes doubtless does not depend upon the causes of the ultimate choices, yet that process is a purely psychological one, and the economist's account of it should be in close harmony with the psychologist's conception.

Moreover, the great theorems of distribution, and even of production, as we have indicated, contain predictions as to human motivation which give them much of their significance. It may be that these predictions are also independent of the reasons for ultimate choices, but let us, for illustration, examine the connection of the psychology of motives with the specific productivity doctrine in its most general form. Veblen calls this "a theory of valuation, and hence only of distribution," but it is a partial theory of production also, since it tells why land and labor are devoted to producing certain things, wheat, for instance, and not certain others, ragweed, for instance.

The specific productivity theory is often criticized on the ground that it confounds the right of appropriation,

under certain property assumptions, with the principle of physical causation. To show that, under free competition and private property, the owner of one of the scarcer necessary elements in production can *appropriate* a larger share of the product than the owner of one of the more abundant, is not to show that the total product was physically *produced* by the joint elements in the ratios which their remunerations bear to one another. As Professor Clark admits, when you get down to one man sawing wood, it is hard to apportion responsibility for the cutting between the man and the saw. Water is as necessary to the fattening of a hog as is corn, but in the specific productivity formula, the increased weight is produced by the corn alone. And so on.

But such criticisms arise from unfortunate statements of the theory. What its proponents mean is, that the consumers who want more of any product, say of pork, are not so much concerned with the physics and chemistry of the fattening process as they are with finding what factor is, by its scarcity, holding up production, and with securing more of that factor. If we can get more corn, we shall have more pork; no more corn or similar feed, no more pork, tho we get oceans of water. Economically, the corn is the one thing necessary, the economic cause, if you like, of the larger amount of pork we want. For this reason we are willing to give up something valuable to get more corn, whatever may be our social institutions; but we will not pay anything for more water. In this way, any part of the utility of the finished product may be imputed to the elements necessary to produce it, according to their relative scarcity.

But is its utility the only reason why we *pay* more for the corn than for the water? So far as our society is

rational, it is not. If neither supply can be changed by human efforts, there is no good reason for allowing an owner to appropriate the corn and charge us for it what the traffic will bear. We expect to pay higher for the scarcer materials in most cases because the supply can be increased by human efforts, and because those efforts will be more strenuous, the higher the pay. And these efforts will be directed to producing the materials which are scarcest, relative to the needs for them, because for such will the highest rewards be offered. That seems to be the common sense of the specific productivity theory. It is of little significance aside from its theory of motivation.

In order that it may be used to justify private property and free competition to the fullest extent, on the ground that under these institutions the community's productive resources automatically are devoted to supplying the goods which are most urgently wanted, it is necessary to assume that the larger money offer always means the greater human want. What qualifications of this assumption may be necessary is a psychological question, as we have seen.

But in order that the theory may have any social interest at all, the assumption must be made that the more pay you offer men for a given product, the more of that product they will manage to supply you. This is the "utilitarian" theory of motivation. The propounders of specific productivity usually apply this theory of motivation to human, as well as material agents, assuming that a relatively high level of wages in any occupation attracts numbers of workers into that occupation, by means of larger families within its ranks, or by greater efforts among members of other ranks to give their children or themselves the necessary training to enter the first, until equality of wages between occu-

pations is secured. Of course the "utilitarian" theory of human motivation is not the peculiar property of the specific productivity theorists, it is assumed in all the most important explanations and advices given by economists of all persuasions. There is no doubt that it is sufficiently life-like in modern society to make our explanations in the main sound. But if there are psychological possibilities of withholding an "unproductive surplus" which it is not necessary to pay, to induce certain personal services, as critics claim, that is worth looking into. We now admit rather generally that there may be more economical methods (to society) for inducing the services of natural agents and monopolies than that of paying the owners who have been allowed to appropriate them, according to the full marginal utility of the agents' services; and perhaps the same principle might apply to capital and to the rarer personal abilities — if there really are no marginal savers, and if the creative impulses are so strong.

Of course we may be convinced that the "utilitarian" assumption is true of the race of men we know, and of that which the world has always known. For purely static purposes we may take it as a "fact of choice," and refuse any psychological ministrations from the institutional economists, with their jargon of "pecuniary culture," "prescriptive authority," etc. Yet we are rather intrepid if we project such assumptions into the future, and insist that psychological research can never throw light on the question of what human nature might become under other institutions than those of the present or of the past. It may be there is no possibility of other perfectibility in mankind than in knowledge, which will be used in the service of cunning, but if we have any appreciation of the strength of custom and public opinion, we shall want to consider the psychol-

ogists' dissections of habit and instinct, in our estimate of the future.[1]

A multitude of dynamic propositions at once more immediately feasible and more fundamental for social improvement, however, await upon a better knowledge of human nature than economists generally now possess. Such are those involving education of consumers' demands, the stimulation of productive effort, and the avoidance of standards of consumption which are futile or harmful. If all people chose spontaneously to spend their incomes in the directions which are, in the long run, most beneficial to themselves and everybody else, the millennium would be realized under the competitive order. All would work out according to the specific productivity ideal. And likewise in a collectivist society production and saving would be ultimately determined by consumers' (voters') demands, and so the millennium in this case too depends upon better standards of consumption. Very likely the luxurious demands of the rich would not divert so much productive power away from necessities in such a state; but most of us, socialists as well as liberalists, will admit that the masses' individual demands need considerable improvement. If we desire — not necessarily as economists, but as men having the social welfare at heart — to do some-

[1] The Comtean "hierarchy of science" supplies an interesting side-light at this point. The sciences, as Comte showed, may be arrayed in simple to complex order, corresponding to the relations subsisting in their subject-matter. If we start with the mathematical and logical sciences as the "lower," and proceed through the physical, biological, psychological and social sciences, we shall notice that each science for its completion presupposes most, if not all, of the results of all the other sciences "below" it, but none of the laws of sciences "above" it. We believe that neither Comte nor anyone else ever supposed that much fruitful and exact work in any of these fields must await upon any particular degree of completion of the simpler fields; but it is useful to remember this relationship, which signifies that any well-authenticated discovery in a simpler field, which is inconsistent with an assumption in one of the more complex, makes necessary the revision of the latter so as to harmonise with the former. Psychology, for example, must adjust itself to all facts of the physiology of nervous tissue.

This application of the Comtean formula was made by Richard Jennings, in his Natural Elements of Political Economy, London, 1855.

thing effectual toward improving consumers' demands, we shall learn what we can about the psychology of wants. We shall go to the roots of customs, institutions and the other social influences, and by understanding the source and extent of their power over us, shall learn to harness that power toward making nature supply more freely the materials for realizing our ideals. Such study may not be economics, but it is certainly part of the social physiology which must be developed before social medical treatment can be most efficiently administered. It is one of the fundamentals of the theory of welfare as related to wealth, which nearly all economists feel bound somehow to consider.

The suggestion mentioned above, that current theory is sufficiently dynamic, because it simply works out principles of reasonable and economical use of resources, which must be conformed to if the group is not to be ousted from the world by another group which does conform to them, must be borne in mind lest we make our theories too comfortably humanistic by overlooking the stonewalls of fact which we are about to bump our heads against. Altho correspondence to existing human nature is not the last criterion of economic theory, yet human nature is one of the elements which our active adaptive process has to work with, in adjusting our society to its physical environment. The best possible institutions (which we may have some hand in framing) must have a double adjustment — to the nature of man and to the nature of the physical universe. Our bodily structures also may not be as adaptive as those of some of our competitors, but in order to improve them, we must know the principles upon which they are organized.

And so our tentative conclusion is that an accurate knowledge of the psychology involved in economic behavior is needed in economic theory, not so much for

static as for dynamic purposes. It is needed for static theory if we want to be assured that our static theory is as complete and fundamental an explanation as the existing state of knowledge permits. But it is vital for dynamic theory, which looks beyond the existing conditions of wants, social structures and industrial devices, and prophesies what *would be* the result of various supposed innovations, if they were made. In this same fashion we have long predicted the probable results of hypothetical taxes and tariffs on production, distribution, etc. If we can set up hypotheses as to ways of changing consumers' demands, or producers' springs to action, which psychological science shows to be plausible, and trace their effect on economic life, we shall be adding to the purely scientific theorems which the legislator or reformer may find helpful. And aside from the possible applications to pure economic theory, such knowledge of motives is bound to be useful in the practice of social art.

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LATIN AMERICAN FOREIGN EXCHANGE AND INTERNATIONAL BALANCES DURING THE WAR

SUMMARY

The credit-exchange arrangements, 422. — Comparison of the course of exchange in the four leading countries, 425. — Buenos Aires and Montevideo exchange, 428. — The Argentine balance of international payments, 431. — Quantity exports of meat and cereals, 436. — The Chilean trade balance, 438. — Nitrate, exports, production, prices, 439. — Exports of coffee, 443. — Interest payments, 443. — Chilean exchange a depreciated paper exchange, 445. — The fall of the rate since the armistice, 448. — The new exports and industries of Brasil, 449. — The fall of Brazilian exchange, 453. — The decline of exports (and prices) of coffee and rubber, 455. — Comparison of trade balances of Brasil, Argentina, and Chile, 459. — Foreign borrowings of Brasil, 460. — Budgetary deficits, 462. — Inconvertible paper money, 463. — Interest payments, 464.

I. The Exchange Situation

To the student of international trade the experiences of Latin America during the war offer interesting material for analysis. Especially interesting is the course of foreign exchange. Exchange has fluctuated with a violence that would be impossible in normal times; and the fluctuations have occurred in response to commercial and financial changes particularly significant for these "young countries," whose business of making a living consists chiefly in exchanging their raw produce for foreign manufactures, and whose capital is obtained almost entirely by foreign borrowings.

So abnormal did the exchange situation become in the later stages of the war that in some cases "credit-exchange" agreements were resorted to at the solicita-

tion of the United States and the Allies. In January, 1918, Argentina entered into a "Grain Convention" with Great Britain and France, whereby a credit of $200,000,000 was granted to those nations to finance the purchase of 2,500,000 tons of Argentine wheat of the 1917–18 harvest. Shortly afterwards a similar credit fund was extended by Argentina to the United States, for $40,000,000. In February, 1918 the Uruguayan congress sanctioned a credit of $15,000,000 to Great Britain; and in July, one of $20,000,000 to the United States.[1]

These various "credit-exchange" conventions had as their main purpose the stabilization of exchange without resort to gold shipments. Their general character may be shown by a brief description of the arrangement between Argentina and the United States. By way of a beginning, we may recall the basic principle of the exchange mechanism as it operates in normal times: that, in response to the conditions of demand for and supply of bills of exchange (represented respectively by those who owe payments abroad, and those who receive payments from abroad), exchange fluctuates within the narrow limits of the "gold points," and cannot depart farther from par, for the reason that with the rate at specie point it becomes cheaper to make or receive payment (as the case may be) in gold, including cost of carriage overseas, than by bill of exchange. Gold thus flows out of or into the given country according as exchange is at the gold export point (unfavorable to importers and other debtors to the outside world) or at gold import point (unfavorable to exporters and other creditors of the outside world). Such, very baldly, is the mechanism in peace times. But the United States government was at war, and had placed an embargo on the

[1] A similiar arrangement between the United States and Chile was under discussion last summer, but was not put into operation.

export of gold; so that the delicate mechanism of the gold points was upset. Thereafter, the fluctuations of the rate of exchange became much wider and more violent, being governed wholly by the conditions of supply of and demand for bills, without the possibility of gold movements to relieve the pressure on the rate. In the case of Argentina the rate had risen to a figure such that the peso was at a premium of about 13 per cent over the dollar; and this for the reason, as we shall see more fully later, that Argentina had a large balance of international payments due to her, and therefore an excessive supply of bills offered for sale in the Buenos Aires market. Further purchases of Argentine exports would increase that supply of bills, and drive the rate still higher. How relieve the pressure and force the rate back toward its normal level without resorting to gold shipments?

The following system was devised. The New York importer who bought goods in Argentina was permitted to settle by giving a check upon his New York bank to the Federal Reserve Bank, which sold him an order for pesos payable in Buenos Aires. The Argentine government, through the Banco de la Nación, lent to our government (i. e., to the Federal Reserve Bank) the required pesos, delivered in Buenos Aires, to pay the bill to the Argentine exporter. The Banco de la Nación agreed not to draw upon the Federal Reserve Bank during the period of the credit-exchange arrangement, but to content itself with allowing its credit to grow. This arrangement was to continue until the credit had grown to $40,000,000 (later increased to $100,000,000). Thus, the New York importer paid his debt (to the Federal Reserve Bank), the Argentine exporter received payment (in paper pesos issued to him by the Banco de la Nación); and no remittances, whether of gold or of

ills of exchange, took place between the two countries. ut our government owed to the Argentine government growing debt, to be paid off after the war, in gold or in oods; and to make that payment it had the sums reived from our importers. In other words, for the uration of the agreement the whole process of paying r our Argentine imports ceased to be a foreign exange transaction at all, or rather, as it has been comonly put, it became a "credit-exchange" transaction. rgentina exchanged that part of her exports which ceeded her imports for a credit, to be paid off at a ture date. By this arrangement the excessive supply exchange, represented by the exports, was withdrawn om the exchange market, which almost immediately ll markedly in the direction of the par rate.

Our present interest is not in the credit-exchange arngements themselves, but in the abnormal situation hich made them necessary. They have been described, ry briefly, merely as a means of setting forth some pects of that situation, and of the forces which undery it. The purpose of this paper is to compare the urse of foreign exchange in the four leading South merican countries — Argentina, Brazil, Chile, and ruguay — during the war; and to study some of the ief commercial and financial changes responsible erefor. The accompanying chart will serve as a arting point for the discussion.

The chart compares the course of exchange on 90-day ght sterling bills in the four countries named, for the riod 1914–18. To render the fluctuations of the four rves comparable with each other, the actual quotaons for each country, averaged for each month, are pressed in terms of their percentage deviations from e mint par of exchange between the gold currency nit of the country in question and British currency. In

Latin American countries sterling exchange is quoted in British pence, the par of exchange being 47.58*d.* per Argentine peso, 16*d.* per Brazilian milreis, and 51*d.* per Uruguayan peso. In the case of Chile, as will be described more fully later, the par of exchange, 18*d.*, is merely "nominal" since the law declaring the value of the peso to be 18*d.* is inoperative, the currency of the country being in fact depreciated inconvertible paper.

As an indication of the degree of abnormality of the exchange fluctuations, the "gold points," within whose limits the rates of exchange fluctuate in normal times, are drawn on either side of the par line. Since the margin between the par of exchange and the gold import and export points is not the same in any two countries, varying, among other factors, with the distance (and consequent freight costs) between the exchanging countries, ample margins have been allowed, + 2 per cent (premium) being taken as the gold import point, and −2 per cent (discount) as the gold export point.[1]

It is at once apparent that in all four countries exchange departed widely from the usual limits. The mechanism of gold points broke down completely. Even the Buenos Aires exchange, which shows the least violent dislocation, rose in December, 1918, to about 54*d.*, a premium of 13 per cent. Montevideo exchange rose as high as 65½*d.*, in May, 1918, a premium of 28 per cent. Brazilian exchange, on the other hand, depreciated, falling as low as 11½*d.* in October, 1914 (a discount of 31 per cent), and fluctuating since that date

[1] Throughout this paper the terms "premium" and "discount" have reference to the monetary units of the South American countries under discussion, and not to British currency. Exchange being quoted in British pence, a rise of the rate means that more pence must be offered for the peso, or the milreis as the case may be. In other words, a rise above par signifies a discount on sterling, and a premium on the peso. Contrariwise, a fall below par means a premium on sterling and a discount on the peso. The rise and fall of the Latin American sterling exchanges, therefore, are to be interpreted in just the contrary way from the rise and fall of sterling exchange in New York. Since the New York quotations are in United States currency, a rise signifies a discount on the dollar, and a fall a premium on the dollar.

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between 12*d.* and 14*d.* (12½ per cent to 25 per cent discount). The Chilean exchange movement was unlike any of the others. It was by far the most striking. As in Argentina and Uruguay, the general trend was upward; but the upward sweep was of incomparably greater extent than in the case of either of those countries. On the other hand, notwithstanding the spectacular ascent of the rate, Chilean exchange at no point rose to the statutory par, but remained throughout a depreciated paper exchange. The Chilean situation, complicated as it is by the depreciated paper basis of the currency, must be left for later treatment.

Leaving out of account for the present, then, the complicating factor of depreciated paper currency in Chile, the outstanding facts shown by the chart are two:

1. The abnormality of the fluctuations of exchange in all countries, and
2. The striking difference, as regards the direction of the exchange movement, between Brazil on the one hand, where the rate has fallen markedly, and Argentina, Uruguay, and Chile on the other, where exchange has risen no less markedly. The explanation of this difference is the main purpose of this article.

The abnormality of the exchange fluctuations in itself requires no further comment. As we have seen, it was the inevitable consequence of the violent interruptions and alterations of commercial and financial international currents occasioned by the war, coupled with the reluctance of the countries at war to part with gold, and the consequent embargoes placed upon its export.

We shall proceed to the consideration of the second point, the comparison of the exchange movements in the several countries; and we shall discuss the changes in foreign trade and finance responsible for those move-

ments. Enough has been said, in the consideration of the Argentine credit-exchange arrangement, to indicate the general lines of the analysis. Since the rate of exchange fluctuates with the conditions of supply of and demand for bills, and since the supply and demand comprise all international transactions, the first originating in those transactions for which payment is due to the given country, and the second in those for which payment is demanded from the country by the outside world, our analysis of exchange movements resolves itself into a study of the balance of international payments in each country, an offsetting of "credits" against "debits." On the credit side of the balance are the exports, borrowings of foreign capital, interest receivable on capital invested in other lands, and other items for which payment is due to the country. On the debit side are the imports, interest owed on foreign capital invested in the country, immigrants' remittances, maritime freight charges, and other such items. Not all of the items are available for each country, but because of the striking character of the changes that occurred, it is possible to arrive, substantially, at definite conclusions regarding their effects. In addition to the balance of international payments, some attention must be given, briefly, to the monetary complications — so prevalent in South American countries — which affect the nature and course of the exchanges. We begin with Argentina.

II. Exchange and the Balance of International Payments

1. *Argentina*

Buenos Aires exchange rests securely on a gold basis, the unit being the gold peso (= 47.58*d.*, or United States $.965) created by the Monetary Law of 1881.

For two decades after the passage of this statute, however, the real currency of the country was depreciated inconvertible paper, the premium on gold fluctuating violently. During the Baring Panic of 1890–91, which was precipitated by extravagant borrowing of foreign capital and a consequent land and railroad boom, coincident with lavish issues of paper under the National Bank system, the premium reached a height of 364 per cent,[1] a figure probably not paralleled in any important country in the nineteenth century.

By 1899, however, largely in consequence of a succession of favorable balances of international payments, and a consequent inflow of gold, the premium on gold had fallen to 127 per cent, so that the paper peso was worth $.44 of the gold peso of 1881. By the Conversion Law of 1899 the value of the paper peso was definitely stabilized at the existing rate, $.44 gold, by means of a conversion fund for the free exchange of paper into gold and gold into paper at that rate. Since 1899, therefore, the paper currency, the only currency in use in the country, has maintained a stable value, resting securely upon a gold basis. The Uruguayan is also a gold exchange, the peso having a par value of 51*d.*, or United States $1.034.

Turning now to the war period, our chart (p. 426) indicates that until August, 1914 Argentine exchange fluctuated within the specie points, the extreme fluctuations being 47 1/16 (July) and 48 3/8 (March), 1.9 per cent below par and 1.6 per cent above par respectively. In August and September, 1914, the exchange market was virtually inoperative, Buenos Aires being quoted as "nominal." Thereafter the fluctuations became wider, but did not depart far from the gold import point until

[1] In October, 1891. See Martinez and Lewandowski, La Republica Argentina en el Siglo XX, p. 479.

the fall and winter of 1916–17 (Argentine spring and summer), when the exchange rose to 52 (January, 1917), a premium of over 9 per cent. In the following winter exchange rose to 53⅛ (December, 1917), a premium of 13 per cent.

Up to this point, the Argentine and Uruguayan exchanges were markedly in sympathy with each other. This correspondence was to be expected, since the two countries form, in many respects, a homogeneous trade area, buying and selling the same commodities, and financing their international transactions through the same hands. After January, 1918, however, the correspondence was lacking. Montevideo exchange ascended to 64⅛*d.* (27.9 per cent above par), while the Buenos Aires exchange, after an initial fall to 50⅛*d.*, remained fairly stable. This lack of correspondence of the two exchanges is ascribable mainly to the credit-exchange arrangements which have been described. It will be recalled that the Argentine conventions went into effect early in 1918, the Uruguayan agreements not being completed until summer.

Throughout the course of both of these exchanges there is noticeable an annual wave movement, reaching its crest in the winter months (South American summer) and its trough in the summer months. This wave movement is due chiefly to the alternation of active and inactive seasons in the export trade. From October to May, approximately, the harvest comes to port and is shipped; there is consequently a flood of bills of exchange offered for sale by the exporters, and the rate moves upward. From May to October, the exchange market is less active.

The most important feature of the exchange movement is the marked rise, appearing first in the winter of 1916–17, and becoming still more striking in the winter

of 1917–18. This rise is to be explained by reference to the changes occurring in the balance of international payments.

For the analysis of these changes we are fortunate in having the computations of Dr. Alejandro E. Bunge, Director General of National Statistics of Argentina, and those of Señor Carlos Alfredo Tornquist, one of the most eminent bankers and financiers of Argentina.[1] Dr. Bunge has computed the Argentine balance of payments for 1916, and Sr. Tornquist has computed the balance for each year since 1913.[2]

For the purpose of this study it will be sufficient to present the summary figures of Sr. Tornquist's balances for 1913–14 and 1916–17. Sr. Tornquist makes his computations for the Argentine "economic year," October 1 to September 30. In the following tables these balances are given in summary form. The first gives the balance for the year 1913–14, the second for the year 1916–17.[3]

[1] Sr. Tornquist possesses the best financial and commercial library in Buenos Aires. His father, the late Sr. Ernesto Tornquist, was the intimate adviser of Presidents Pellegrini and Roca during the period following the Baring Panic (1890–91), and, with finance minister Dr. J. M. Rosa, the author of the Conversion Law of 1899.

[2] These balances were presented to the writer during a visit to Buenos Aires in 1917–18, as travelling fellow from Harvard University.

[3] The reader will note the absence of the item of freight charges from the Argentine balances. This omission is intended. Freight charges do not constitute an item in the international payments of Argentina, by reason of the method followed in recording the statistics of foreign trade. "Value of Imports" is compiled by the use of an official list of import prices ("tarifa de avaluos") which serve as standards for the computation of custom duties. When originally drawn up this list represented the actual prices of imported commodities and thus included freight charges on imports. From lack of regular and accurate revision of the list, however, the "tarifa de avaluos" has for years past conformed very imperfectly to actual import prices, and Dr. Bunge, Director General of Statistics, has initiated the practice of correcting the import statistics compiled from this list, by reference to the actual market prices. Concerning freight charges on exports Dr. Bunge says: "The prices taken (as the basis for compiling 'Value of Exports') are those of our (the Buenos Aires) market. Maritime freights, which do not come into the country because all the shipping which carries our products is foreign, are not paid by us; they do not occasion either a credit or a debit of our country toward the outside world, and ought not to figure as an item of our foreign commerce." El Intercambio Economico de la Republica Argentina en 1916, p. 13.

THE ARGENTINE BALANCE OF PAYMENTS, 1913–14

(Thousand gold pesos (peso = $.965))

CREDIT		
1. Exports	404,250	
2. Capital invested [1]	114,000	
Total		518,250
DEBIT		
1. Imports	392,100	
2. Debt Services	177,300	
Total		569,400
BALANCE	−51,150	
Reduction of Gold Stock in Country	+32,600	
NET BALANCE		−18,550

THE ARGENTINE BALANCE OF PAYMENTS, 1916–17

(Thousand gold pesos (peso = $.965))

CREDIT		
1. Exports	599,300	
2. Capital invested	30,300	
Total		629,600
DEBIT		
1. Imports	357,500	
2. Debt Services [2]	201,500	
3. Immigrant's Remittances	10,000	
4. Tourist's Expenditures	3,000	
5. Subscriptions to War Loans	8,500	
Total		580,500
BALANCE	+49,100	
Increase in Gold Stock of Country	−33,143	
NET BALANCE		+15,957

[1] The separate items under "Capital Invested" are:

1. Two loans contracted by the national government, and one by the federal capital	$46,200,000
2. Securities issued in Europe by railroad and other companies in Argentina	34,300,000
3. Bonds sold in Europe (cedulas, paving bonds, etc.)	23,500,000
4. Interest reloaned by mortgage companies	5,000,000
5. Private mortgages and other investments	5,000,000
Total	$114,000,000

[2] The separate items under "Debt Services" are:

1. Service of the public debt	$49,800,000
2. Service of foreign mortgage investments in Argentina	16,800,000
3. Service of cedulas	9,900,000
4. Service of railway capital	40,000,000
5. Service of other foreign capital	32,000,000
6. Repayment of short-time public loans	53,000,000
Total	$201,500,000

These tables indicate a reversal of the Argentine international situation between the last year prior to the war and the year ending September 30, 1917. If we leave out of account, for the moment, the item relating to changes in the gold stock of the country, we find in 1913–14 that the balance was unfavorable to Argentina by $51,150,000. It is well known that the year 1913–14 witnessed a "near-panic" in Argentina; the unfavorable balance of payments, the consequent downward pressure on exchange, and the large outflow of gold were important factors in that situation. Turning to 1916–17 we find a different situation. The balance of payments is favorable, the excess of the credit account over the debit account amounting to $49,000,000.

But both of these figures were reduced by international gold movements; and since the interruption of gold movements forms an important part in the explanation of the abnormal state of the Latin American exchanges, the figures of the balance sheets relating to this item deserve separate attention. By virtue of the normal exchange mechanism, already reviewed, an excess of debits over credits drives exchange to a discount and induces an outflow of gold; and, contrariwise, an excess of credits over debits drives exchange to a premium and induces an inflow of gold. Gold movements, therefore, constitute the *balancing item*, so to speak, of international payments, by means of which credits and debits, and consequently the rate of exchange, tend toward a state of equilibrium. In view of this fact one would expect from the terms of the balance of 1913–14 to find a considerable outflow of gold. Such an outflow did occur, the net reduction of the gold stock of the country in that year being $32,600,000. Subtracting this sum from the unfavorable balance of $51,600,000, we obtain a net uncovered balance of $18,550,000 " against " Argentina.

In the same way, in 1916–17, one would expect, normally, a considerable inflow of gold; and such an inflow did occur, the net addition to the country's stock of gold in that year being $33,143,000. Subtracting this amount from the favorable balance of $49,100,000, we have a net uncovered balance of $15,957,000 " in favor of " Argentina. But in 1916–17 such a net inflow of gold appears at first glance surprising, since, as has been said, the nations at war had placed an embargo on the export of gold. The details of the gold movement in 1916–17 are therefore essential to an adequate understanding of the Argentine situation. Sr. Tornquist has given the figures of the gold movement by quarters; the net import in each quarter being as follows:

(000's omitted)	
Last quarter of 1916	$6,772
First quarter of 1917	24,021
Second quarter of 1917	2,301
Third quarter of 1917	49

It is seen that virtually all of the gold entered the country in the first two periods. The falling-off in the second quarter of 1917 is striking; and in the third quarter the gold movement is negligible. The heavy imports up to April, 1917, came from New York. They came in consequence of a balance of payments becoming increasingly favorable to Argentina. They served, in part and for the time, to meet that balance, and thus prevented the rate of exchange from rising so high as it would otherwise have risen. When the United States entered the war, the flow of gold from New York dwindled (as it had already done from the other countries at war), and soon ceased. The effect is seen in the next Argentine export season, the fall and winter of 1917, when the rate of exchange went much higher than in the preceding year, and made necessary the credit-exchange arrangements.

Further examination of the tables that have been given for 1913–14 and 1916–17 indicates in what manner the reversal of the balance of payments occurred. In the war period the flow of capital to Argentina, which in 1913–14 amounted to $114,000,000, was virtually cut off. Interest charges and other financial payments meantime increased, mainly through the paying off in 1916–17 of $53,000,000 of short-time public loans. These changes increased the net outgoings on all items of the balance except the foreign merchandise trade by $129,400,000. This increase on the debit side of the balance, however, was much more than offset by the striking change in the balance of merchandise trade. Exports increased $195,050,000; and at the same time imports decreased $34,600,000; with the result that the merchandise balance in 1916–17 was favorable by $241,800,000, a sum so large as to offset the net debit of $129,400,000 incurred on all other items, and leave a surplus of $49,100,000. Even after allowing for the "balancing item" of a net import of gold of $33,143,000, we find a net uncovered balance in favor of Argentina of $15,957,000 on all international transactions.

This striking alteration of the balance of merchandise trade is characteristic of all the Latin American countries. In all of them imports have been restricted, mainly by reason of the scarcity of shipping, the need for redistributing tonnage with a view to war requirements, and the desire on the part of the nations at war to conserve both tonnage and goods. In Argentina, Uruguay, and Chile, the shrinkage in imports has been accompanied by an extraordinary expansion of exports, in response to the war-stimulated demand of Europe and the United States for food stuffs and materials of war. It is this change in the merchandise balance which is mainly responsible, given foreign embargoes on gold, for the striking variation of foreign exchange.

Since the Argentine balances of payments have been presented with greater fullness and precision than is possible for the other countries, the simple presentation of the balances will suffice as an explanation of the rise of Buenos Aires exchange. There is not space for a detailed consideration of the merchandise trade by itself. The most important change therein, the great increase in value of exports, was due to the nature of the exports, of which meat, wool, and cereals are the chief. It is interesting to note, however, that the growth in value of exports was not wholly, or even chiefly, due to an increase in quantity exported. In 1917, the year we have studied, there was in fact a striking decrease in quantity, in the case of some of the chief exports. The following figures show the exports of meat and cereals from Argentina and Uruguay combined, for the period 1914–17.

EXPORTS OF MEAT AND CEREALS FROM ARGENTINA AND URUGUAY, 1914–17 [1]
(1000 tons)

	1914	1915	1916	1917
1. Meat:				
Carcasses of frozen sheep and lambs	2,845	2,246	2,165	1,609
Quarters of frozen beef	1,963	4,457	5,718	5,335
Quarters of chilled beef	3,398	1,309	933	670
2. Cereals:				
Wheat	958	2,449	2,245	898
Maize	3,512	4,331	2,827	896
Linseed	862	995	639	140
Oats	360	501	785	271
Barley	21	76	53	11

It will be seen that in these two, the most important branches of Argentine trade, quantity exports after a

[1] Data from the Argentine official Anuarios del Comercio y de la Navegacion, and Business Conditions in the Argentine, No. 40, Ernesto Tornquist and Co., Ltd., pp. 14–15.

rise in 1915 barely held their own in 1916, and in 1917 descended very considerably below the figures of 1914. The decrease of meat exports is ascribable to the increasing scarcity of shipping. The shrinkage of cereal exports, which is especially marked in every item, was due partly to shipping scarcity, but mainly to the drought and frost which in many districts ruined the 1916–17 harvest. It will be recalled that President Irigoyen placed an embargo on wheat for a time, and only consented to release wheat to Great Britain on condition that each shipment be replaced by an equal quantity of Australian wheat.

The increase of the value of exports, then, was mainly due to an extraordinary rise in export prices. Wheat selling at about $10 per 100 kilos in July, 1914 sold for $19 in June, 1917; corn rose in the same period from $5.75 to $13.50; linseed from $14.60 to $25. Wool selling at $7–$12 (paper) per 10 kilos, according to grade, in July, 1914, sold at $8–$18 in March, 1917, and at $20–$32 in January, 1918.[1] Similar increases, of from fifty to several hundred per cent, occurred in the other exported products; with the result that, notwithstanding considerable diminution in the quantities exported, the total value of exports showed marked expansion from the pre-war figures.

The Argentine situation, therefore, is sufficiently clear. The abnormal rise of foreign exchange was due mainly to the large favorable increase of the balance of merchandise trade. Let us compare with this situation that of Chile and of Brazil. In the case of these countries, since data concerning the " invisible " items of the balance of payments are meager and of uncertain reliability, we must treat mainly of the merchandise trade.

[1] Boletines de la Bolsa.

2. *Chile*

The following figures show the Chilean balance of merchandise trade from 1910 to 1917: [1]

CHILEAN BALANCE OF MERCHANDISE TRADE, 1910–17 [2]
(Thousand gold pesos (peso = 18*d.*, or U. S. $.365.))

Year	Exports	Imports	Balance
1910	$328,827	$297,486	$+31,341
1911	339,409	348,990	−9,581
1912	383,228	334,455	+48,773
1913	396,310	329,518	+66,792
1914	299,675	269,757	+29,918
1915	299,591	153,212	+146,918
1916	505,963	222,521	+283,442
1917	703,544	355,077	+348,467

One's attention is arrested by the extraordinary growth of the balance in favor of Chile since 1914. The surplus increased from about 30 million pesos in 1914 to about 147 millions in 1915 (a fivefold increase), 283 millions in 1916 (a tenfold increase), and 348 millions in 1917 (a favorable surplus almost twelve times as large as that of 1914). On the other hand it should be noticed that the balance of 1914 was below the average for prewar years. The explanation of these changes in the balance is to be found in the first two columns of figures, which indicate the different effect of the war on Chilean trade at the beginning of the war and in later years. In 1914 there was a shrinkage both of exports and of imports, that in exports being particularly marked. In 1915 exports held their own but showed no increase, whereas imports decreased some 33 per cent from the 1914 figures. In 1916, the outstanding fact was the

[1] Anuario Estadistico, 1918, pp. 287–289.

[2] Some of the data and some portions of the text of the sections of this article devoted to Chile and Brazil are from a series of papers on Latin American trade balances and foreign exchange prepared by the writer for the Bureau of Foreign and Domestic Commerce, and distributed in typewritten form as "Latin American Circulars," in July and August, 1918.

enormous increase of exports, which gained almost 70 per cent in a single year, and set a new high-water mark in Chilean trade. In 1917 there was another large increase in exports. Imports also showed some gain, tho to a much less degree than did exports.[1] Broadly speaking, the figures indicate that the large favorable trade balance was due to the remarkable expansion of exports and to the shrinkage of imports.

The expansion of exports is ascribable chiefly to the growth of the nitrate trade to meet the war demand for explosives. Prior to the war about three-fourths of the exports of nitrate was for fertilizers, and about one-fourth for explosives. Under war conditions these proportions were reversed, only some 20 per cent of the exports being used for fertilizers and the rest for explosives and general chemical uses. The effect of the war upon exports of nitrate, and the importance of this product in the total trade of Chile is shown in the following table:

[1] In a study of the relation between the movements of foreign exchange and the balance of international payments, there should, in strictness, be included in the balance only those items which give rise to exchange operations. In much of the discussion of international balances this principle is overlooked. Merchandise trade figures, for example, are usually included in the balance in their entirety, as a matter of course. Yet it is by no means certain that all exports and all imports give rise to exchange transactions, or play any direct part in that chain of phenomena (exchange movements — gold movements — price changes — trade changes) so familiar to the reader of Mill or Cairnes. Without going into any detail, we may point out an important instance in the case of Chilean imports. In 1917 the exports of Chile to the United States were $142,000,000; the imports were $57,000,000, or about one-sixth of the total Chilean imports. These are the United States Department of Commerce figures. More than half of the so-called "imports" of $57,000,000, however, was represented by shipments of construction material and supplies to the Braden Copper Co., the Chile Copper Co., the American Smelting and Refining Co., the Bethlehem Steel Co., and the Du Ponts. All of these companies are American. The supplies sent to them were paid for in New York, and did not, therefore, have any effect whatever on the exchange situation in Chile. For unlike true imports they did not "make" Chilean exchange. Analysis of the Chilean imports, then, shows that the surplus of exports over imports (and the consequent upward pressure upon the exchange rate) was even greater than that shown by the official trade statistics. See Hearings before the Committee on Banking and Currency, United States Senate, Sixty-fifth Congress, Second Session, on S. 3928, statement by Mr. Leopold Frederick (treasurer of the first three companies named above, and formerly manager of the foreign exchange department of the National Bank of Commerce in New York).

EXPORTS OF NITRATE FROM CHILE, 1910–17 [1]
(000's omitted)

Year	Quantity (tons)	Value in gold pesos of 18d.	Per cent of total exports
1910	2,336	232,426	71
1911	2,449	262,003	77
1912	2,493	286,704	75
1913	2,738	314,909	80
1914	1,847	212,380	70
1915	2,023	232,679	78
1916	2,967	338,529	67
1917	2,798	475,819	68

As regards the quantity exported, the notable facts are the marked shrinkage in 1914 and the even more remarkable expansion in 1916 and 1917. At the beginning of the war, in view of the anticipated decline in the demand for nitrate for fertilizing purposes, many of the oficinas of nitrate-producing companies in Chile were closed, and by the end of 1914 out of a total of 170 only 43 were producing. By March, 1915 the number had fallen to 36.

Since the nitrate industry, as has been shown, represents some three-fourths of the total export trade of the country, and since, moreover, the government derives over 50 per cent of its revenues from the export duty on nitrates, the temporary cutting-off of the foreign market for this product represented a veritable calamity for Chile. The government took immediate steps to induce the producers to keep up operations. The President was authorized to make advances to producers of nitrate of three pesos for each quintal mined, and four pesos for each quintal ready for shipment, provided the producers should agree to keep up production. Authority was given to emit treasury bills, both for the purpose of granting assistance to the nitrate industry,

[1] Extracto Estadistico de la Republica de Chile, 1917, p. 139, and Anuario Etadistico, 1918, p. 185.

above indicated, and also in order to make redis-unts for banks. These rediscounts paid an interest of per cent less than the current rate charged by the anks, and were secured by mortgage bonds. About 1,000,000 pesos of these treasury bills were issued p to December 31, 1914 to nitrate producers, and ,000,000 pesos to banks.

As a result of these measures, combined with the rowing demand of the Allies for nitrate for explosive urposes, the corner was turned after March, 1915, and e number of oficinas in operation began to grow pidly. At the beginning of 1916 we find 116 at work, rt of a total of 172. In January, 1917, 118 were oducing, and by September the total had increased 124. Production therefore showed a substantial covery:

(Thousand quintals[1])

	1914	1915	1916	1917
Production.....	53,500	38,200	63,300	65,100
Exports.....	40,000	44,000	65,000	60,800

Attention is called to the changing ratio between oduction and export. In 1914, only four-fifths of the nount produced was exported. In 1915 and 1916 the ports exceeded the amount produced within those ars. In other words, at the outset of the war nitrate s not moved off as fast as it was produced. This was so the situation in 1917, owing to a scarcity of ship-ng. The result is seen in the course of nitrate prices Chile. Tho nitrate prices abroad rose markedly, the ice in Chile, in consequence of the surplus stock await-g shipment, failed to respond in anything like the me degree.

It will be noted that down through 1916 the war de-and for nitrate, in view of the circumstances cited

[1] Pan American Union, Bulletin of April, 1918, p. 537.

AVERAGE YEARLY PRICE OF NITRATE PER SPANISH QUINTAL,[1] 1910–16 [2]

Years	Shillings
1910	6s. 11¾d.
1911	7s. 0¾d.
1912	8s.
1913	7s. 10d.
1914	6s. 11½d.
1915	7s. 4½d.
1916	7s. 8d.
1917	9s. to 11s.

above, had virtually no effect on nitrate prices in Chile. In fact, the 1913 price was higher than that of any of the three following years. In the production year 1916–17 (July to June), however, nitrate rose to 9 shillings the quintal. In the last half of 1917, particularly from August on, speculation ran the price up from about 10 shillings to 16 shillings the quintal. It does not appear that there was any sound basis for this rise, and the purchase by the United States government of 200,000 tons of German nitrate which had been lying idle in Chile, served to bring down selling prices to some extent. From the fall of 1917 for the remainder of the war, virtually all of the selling was to the British and United States governments at an officially controlled price. In the summer of 1918 the British government contracted for the purchase of 15,000,000 quintals (about 1,500,000 tons) at the price of 13*s.* for ordinary nitrate and 13*s.* 6*d.* for refined nitrate. Our chart, p. 426, shows that exchange reached its highest point (about 17*d.*, a rise of about 120 per cent above the rate ruling in 1914) while this contract was being made, and indicates strikingly the sympathy between the nitrate market and the exchange market.

[1] Quintal = 101.41 lbs.

[2] Extracto Estadistico, 1917, p. 119; and South American Journal, January 5, 1918, and April 6, 1918.

The other important Chilean export is copper. This, too, experienced a remarkable growth under war conditions. The following table shows the exports of copper from 1910 to 1917:

EXPORTS OF COPPER FROM CHILE, 1910–17 [1]

Year	Quantity (tons)	Value (pesos of 18*d.*)
1910.....	37,804	26,630,704
1911.....	34,587	20,501,183
1912.....	40,897	33,550,041
1913.....	41,323	30,894,566
1914.....	45,227	31,891,726
1915.....	53,587	45,409,745
1916.....	71,904	86,639,941
1917.....	78,183	104,413

Nitrate and copper represent the great bulk of Chilean exports. Other exports, such as cereals, wool, hides and skins, iodine, etc., are too small to exercise any influence on the major changes of the balance of trade. The shrinkage of imports, then, occasioned by the need of conserving tonnage, and the extraordinary expansion of the exports of nitrate and copper sufficiently explain the large and growing favorable balance of trade.

Such was the merchandise trade situation. As regards the "invisible" items of the balance of payments the data are meager and of uncertain worth. For the most important of these items, however, the payments of interest on foreign capital, there are fairly reliable figures. The following is a summary of the interest payments made in 1916: [2]

[1] Extracto Estadistico, 1917, p. 140, and Anuario Estadistico, 1918, p. 184.

[2] Compiled from Extracto Estadistico, 1917, pp. 63–78; and F. M. Halsey, Investments in Latin America and the British West Indies, No. 169 of Special Agents Series, Bureau of Foreign and Domestic Commerce.

INTEREST ON FOREIGN CAPITAL IN CHILE, 1916
(Thousand gold pesos (peso = 18*d.*, or U. S. $.365))

1. Interest and amortization on government foreign debt (429,620,600 pesos, Dec. 31, 1916)	29,973
2. Interest and amortization on railroad guarantees	10,866
3. Interest computed at 6 per cent on mortgage bonds of the Banco Hipotecario de Chile held abroad (total issue 112,000,000 pesos; part held abroad 67,803,000 pesos)	4,068
4. Interest computed at 5 per cent on all other private investment (1,463,472,000 pesos)	73,174
Total interest charge	118,081

Below is drawn up a rough balance of payments for 1916, showing the exports set off against the imports plus the interest payments:

	Thousand gold pesos of 18*d.*
Exports	505,963
Imports plus interest payments	340,615
Balance	+165,348

It is seen that exports alone exceeded imports and interest payments combined by over 165 million pesos. If there was any investment of private capital from abroad in 1916 (and some there was certainly, as is proved, for instance, by the sale of nitrate lands at auction by the government) the surplus in favor of Chile would be increased thereby.

There can be no doubt of the fact, then, that considering the total incomings and outgoings of Chile during the war, the balance was favorable to Chile by a wide margin. The effect of this large favorable surplus upon the rate of exchange was extraordinary. Comparing the rate at the outbreak of war, 7–8*d.*, with the rate ruling in the summer of 1918, 16–17*d.*, we find a rise of about 120 per cent, by far the most extraordinary alteration of exchange in any Latin American country.

This spectacular movement of the Chilean exchange was not due merely to the alteration of the balance of

payments. The changes in the Argentine balance were in the same direction, and scarcely less marked. Yet the movement of Buenos Aires exchange, as shown by our chart, appears insignificant as compared with that of Valparaiso exchange. The maximum rise of Buenos Aires exchange was but 13 per cent. As has been intimated in an earlier place, the reason for this marked difference in the movements of these two exchanges is to be found in the different character of their monetary bases. The Buenos Aires exchange is a gold exchange; that of Chile is a paper exchange. The currency of Chile is depreciated inconvertible paper. There is no specie in circulation, and no specie basis for foreign exchange transactions.

In a comparative summary of South American exchange conditions it is impossible to consider adequately the peculiarities of the paper exchange mechanism, or the forces which govern its operation. In Chile foreign exchange is bought with and sold for paper pesos. The value of the peso, and hence the rate of exchange of bills, depends on a number of highly unstable factors — on the quantity of paper in circulation relative to the domestic demand for money, on rumors as to the probability of the conversion of paper money into specie at some fixed date, on the degree of confidence reposed in the government, and hence on political changes, political gossip or scandal, a controversy in Congress, a political attack in the press. In a country like Chile, whose economic life (and public revenues) depend so largely upon foreign trade and foreign capital, the best single measure of the value of the paper peso is the rate of foreign exchange, which indicates what the peso is worth in terms of foreign gold moneys.[1] Anything which

[1] In other words, the rate of foreign exchange of a depreciated paper currency is substantially identical in meaning with a statement of the value of the depreciated currency in terms of a premium on gold.

affects, or is likely to affect, the conditions of supply of and demand for bills of exchange, will exercise a powerful influence on the (gold) value of the currency, or in other words, on the rate of foreign exchange. If a strike is threatened in the nitrate fields, down goes exchange, for there is danger that the supply of exchange will be reduced by reason of a reduction of exports of nitrate. If there is a rumor that the Chilean government intends to buy submarines in the United States, down goes the exchange again, for the purchase will increase the demand for bills of exchange, and thus drive down the rate.[1]

This condition of unstable currency goes back into the nineteenth century. The present system began with the law of July 31, 1898, which authorized the emission of 50,000,000 paper pesos. At the same time all bank notes previously issued were taken over by the government. Since 1898 the quantity of paper in circulation has been increased to 159,840,119 pesos (December 31, 1916), of which 150,000,000 have been emitted under the act of 1898.[2] The law of 1898 provided for a conversion fund, by means of which the conversion of the paper money into gold at the rate of 18*d.* per paper peso was to begin January 1, 1902. Conversion was postponed, however, until 1905; and before that date was reached a further postponement to 1910 was announced, and then to 1915. Meantime, the gold value of the paper peso, as indicated by the rate of foreign exchange, after maintaining a relatively high level through 1904 (about 16.5*d.*), declined gradually, and for the period 1908–13 ranged between 9.6*d.* (the average for 1908) to 10.8*d.* (the average for 1910). On the outbreak of war, exchange fell still lower, reaching $7\frac{1}{32}d.$ in January, 1915,

[1] Sterling exchange in Valparaiso, it will be remembered, as well as everywhere else in South America, is expressed in terms of British pence.

[2] Extracto Estadistico, p. 65.

a depreciation of 61 per cent from the statutory par. Conversion was again postponed to January 1, 1917, and then to January 1, 1919. In the summer of 1918, with exchange at 16–17*d.*, there appeared to be a strong prospect that specie payments would this time be attempted, at the par rate of 18*d.* named in the law of 1898. This prospect was strengthened by the considerable inflow of gold in 1917. Notwithstanding the reluctance of the nations at war to part with gold, Chile secured their consent to considerable shipments of specie, especially from the United States, as a condition of the sale of nitrate.[1] The following figures show the specie movement for the years 1914–17.

CHILEAN IMPORTS AND EXPORTS OF SPECIE, 1914–17[2]
(Gold pesos of 18*d.*)

Year	Export	Import
1914.....	15,671	3,686,884
1915.....	40,357	1,035,724
1916.....	34,958	30,543
1917.....	522,507	16,446,805

In addition to these gold imports the Chilean government had collected (prior to the war) a gold fund with which to undertake the conversion of the 160 millions of paper pesos in circulation. At the end of 1916 this fund amounted to 87,759,702 pesos (gold), and was deposited in banks of foreign countries, as follows:

[1] Most of the gold imports of 1917 were in connection with the purchase by the United States government in the fall of 1917 of 200,000 tons of nitrate which had belonged to German firms (see above, p. 442). This sale had a double purpose. The United States wanted nitrate; Chile wanted to secure the portion of the Conversion Fund (see text) which was in Germany — about $10,000,000 — and have it transferred to Chile. A three-cornered arrangement was therefore made. The United States bought the 200,000 tons of German nitrate; the United States instructed the Federal Reserve Board to allow the shipment of the equivalent in gold to Chile; the German government arranged the payment in Germany to the former owners of the nitrate (probably in government bonds).

[2] Extracto Estadistico, 1917, p. 64; and Pan American Union, Bulletin of April, 1918, p. 537.

	(Gold pesos of 18d.)
In England	48,765,770
In Germany	22,225,687
In United States	3,124,605
	87,759,702

By March, 1918, the conversion fund had grown to 94,000,000 pesos (gold).[1]

But since the signing of the armistice, there has been a complete reversal of the Chilean exchange situation. The chart at p. 426, shows the fall of Valparaiso exchange in the closing months of 1918. From 16¼*d.*, the rate for September, we have a fall to 9¼*d.* by December 24. In other words, in a space of three months, the rate of exchange returned approximately to the pre-war level. Nothing could indicate more strikingly the fact that the rise of Chilean exchange was purely a phenomenon of war, the consequence of the abnormal demand for nitrate. With the armistice the large purchases of nitrate ceased. The correspondent of the *South American Journal*, writing in January, 1919, stated that "there have been practically no sales at all since October," tho the stocks in Chile were very large; and he estimated that the quantity still in the hands of the British government for sale amounted to 600,000 tons. The price had fallen to about 9*s.* per quintal, and the oficinas had cut down to about half their normal production.[2]

3. *Brazil*

The experiences of Brazil during the war present a rather striking paradox. Apparently she was the hardest hit and at the same time perhaps the most benefited, in a material sense, of all the Latin American

[1] The Economist (London), January 18, 1919, p. 70.

[2] South American Journal, January 11, 1919, p. 77.

countries. The effect of the war upon Brazilian finance, upon the currency, the course of foreign exchange, the foreign trade, has been distinctly less favorable than in the case of the other leading countries.

On the other hand, the serious dislocation of trade occasioned in virtually all Latin American countries by the war has in the case of Brazil brought about industrial and commercial changes which appear to mark the beginning of a new period in its economic life. Much attention has been devoted to cattle raising in southern Brazil.[1] Great packing plants, financed chiefly with American capital, have been built. There has also been a marked increase in the production of cotton and of cane sugar, for which the soil of Brazil, in the long coastal belt stretching from São Paulo to the Amazon, is preëminently fitted. By an arrangement with the Japanese government several thousand Japanese colonists have been brought to Brazil to teach the Brazilians how to grow rice that is cheap and of good quality. Equally significant is the development of Brazilian minerals, of which the state of Minas Geraes, just north of Rio de Janeiro, has a rich and varied supply. The iron deposits, among the largest in the world, had lain dormant before the war; but under the stimulus of war and the difficulty of importing metal products, smelting operations and the manufacture of high grade steel products have been undertaken. The mineral which the war has done most to develop in Brazil is manganese. The chief sources of supply prior to the war were Burma and Russia. The Russian supply was cut off during the war; that of Burma has about doubled since 1913. Brazil, meantime, has come forward as the principal source of manganese.

[1] According to the latest official figures Brazil has 30,000,000 head of cattle, about the same number as Argentina, but of poorer quality.

It is impossible in a paper like the present to describe the other changes that have occurred in Brazil, the rapidly growing exportation of lumber, the new developments in dye stuffs and pharmaceutical products, the really remarkable expansion in the manufacture of textiles [1] and shoes.[2] These latter industries were fairly well established, thanks to very high tariff protection, before the war. Whether they, and the other industries mentioned, will continue to develop without the stimulus of high prices, and under normal conditions of trade, remains to be seen.[3] Our purpose in the present paper is to consider the darker side of the Brazilian war-time condition, and to summarize the chief factors bearing upon the foreign exchange movement.

The striking fact is the marked fall of exchange, as contrasted with the rise in all the other countries studied. Up to July, 1914, exchange fluctuated closely

[1] In 1917 Brazil exported cotton textiles to France. More than half of the home needs in cotton textiles are supplied by Brazilian manufacture.

[2] The output of footwear is now about 20,000,000 pairs a year, over half being produced in the state of São Paulo.

[3] Some New Brazilian Exports

Date	Quantity (tons)	Value (£1,000)	Date	Quantity (tons)	Value (£1,000).
	Refrigerated Meat			*Sugar*	
1913	0	0	1913	5,367	65
1914	0	0	1914	31,860	373
1915	8,514	310	1915	59,074	756
1916	33,661	1,414	1916	53,824	1,286
1917	66,452	3,134	1917	131,509	3,624
	Kidney Beans			*Rice*	
1913	4	0	1913	49	2
1914	4	0	1914	3	0
1915	276	5	1915	3	0
1916	45,594	686	1916	1,124	24
1917	93,428	2,150	1917	42,590	1,262
	Manganese				
1913	122,300	181			
1914	183,630	278			
1915	288,671	536			
1916	503,130	1,478			
1917	532,855	3,062			

out par, 16*d.* per milreis. Our chart shows what occurred thereafter. With the outbreak of war the rate broke so sharply as to compel the closing of the exchange. A bank holiday of fifteen days was declared. October exchange was quoted at the very low figure 11½*d.* In other words, the value of the Brazilian milreis had depreciated about 31 per cent from the rate ruling in July. In November there was a partial recovery, to 14*d.* Then followed another, more gradual, drop to 11–12*d.* in 1916. Since 1916 the rate, tho somewhat higher than in the earlier years, has shown no sign of a return to the pre-war level, but has fluctuated between 12*d.* and 14*d.* (25 per cent and 12½ per cent below par).

As with the other countries, explanation of the exchange movement is sought in the balance of international payments. We begin with the merchandise trade. The following table shows the exports and imports of Brazil for the period 1910–17, and strikes the balance:

EXPORTS AND IMPORTS OF BRAZIL 1910–17 [1]
(U. S. $1,000)

Year	Exports	Imports	Balance
1910	303,000	230,000	$+73,000
1911	321,000	253,000	+68,000
1912	362,246	307,865	+54,381
1913	313,628	326,026	−12,397
1914	221,539	165,747	+55,792
1915	255,659	145,749	+109,910
1916	265,802	194,582	+71,310
1917	290,993	216,319	+74,674

The important fact to be gathered from the preceding table is that *both* imports and exports were at a lower level in the war years than in the pre-war period. The diminution of imports requires no comment. It is a characteristic of the trade of all Latin American coun-

[1] From the Brazilian annual commerce reports, Estatistica Comercial.

tries during the war, the result of the conservation of tonnage and goods for war uses. The falling off in exports, however, is significant. Here again the Brazilian experience is strikingly different from that of the other leading South American republics. The war caused a marked increase of demand for Argentine wheat, meat, and wool, and for Chilean nitrate and copper; and since these products represent the bulk of the exports of those countries, their total exports expanded remarkably. Meantime, Brazilian exports were below the pre-war level. The following table compares the exports of Brazil, Argentina, and Chile for the period 1911–17:

EXPORTS OF BRAZIL, ARGENTINA, AND CHILE, 1911–17
(Absolute figures, in U. S. dollars; 000's omitted)

Year	Argentina	Chile	Brazil
1911	$330,336	$123,884	$321,000
1912	484,109	139,878	362,246
1913	500,986	144,653	313,628
1914	389,022	109,381	221,539
1915	561,803	109,350	255,659
1916	552,945	184,676	265,802
1917	530,914	256,768	290,993

In the following table the exports of these three leading Latin American countries are reduced to relative numbers. In the case of each country the average of the pre-war years 1911–13 is taken as the base (100 per cent) and the index number for each year is computed:

EXPORTS OF BRAZIL, ARGENTINA, AND CHILE, 1911–17
(Index numbers)

Year	Argentina	Chile	Brazil
1911	75	91	97
1912	111	103	109
1913	114	107	95
1914	89	73	67
1915	128	73	77
1916	126	136	80
1917	121	189	88

The index numbers enable one to see more readily than do the absolute figures given in the preceding table just what occurred in the export trade of the three countries. Argentine exports were particularly large in 1915. Chilean exports in 1915 were below the pre-war level. In 1916, however, the growing demand for nitrate and copper manifested its effects, producing an astonishing increase (to far beyond the pre-war level) in Chilean exports of that year; in 1917 the expansion continued. Brazilian exports, meanwhile, were distinctly below the level of the pre-war period.

The reasons for this difference between the experience of Brazil and that of other countries are several. In the first place, it should be said that the decline in Brazilian exports was not a decline in the *quantity* exported. In fact, tonnage of exports in 1916 and 1917 considerably exceeded that of 1912 and 1913. What has happened in Brazil is that the *mean value* of Brazilian export tonnage has constantly decreased. In other words, while prices of exports in other South American countries were rising, export prices in Brazil were actually declining during the war. The mean value per ton of Brazilian exports was $237 in 1913, $179 in 1914, $148.5 in 1915, and $148 in 1916. These figures demonstrate the relatively high value of Brazilian produce to its weight in pre-war years, under normal circumstances, and the striking decline in value per ton during the war.

This question of export prices has, perhaps, a direct connection with the course of foreign exchange. An exporter of wheat in Buenos Aires, for example, in quoting a price to the foreign buyer, would base his quotation upon three factors, the price of wheat in the Buenos Aires market, the maritime freight rate, and the current rate of exchange. With the abnormally high

rate of exchange ruling during the war, the exporter having for sale a foreign bill of exchange received in payment of produce sold, was obliged to sell it at a ruinous loss, owing to the existing depreciation of foreign moneys in terms of the Argentine or Uruguayan peso. To protect himself against loss, the exporter had to raise the price of his goods to a figure sufficient to offset the difference on exchange. In Brazil, as we have seen, exchange was not above normal, but decidedly below it. The bearing of this fact on prices is apparent. Foreign moneys being at a premium, the exporter who had sold abroad Brazilian goods and received a foreign bill of exchange in payment therefor, could cash his bill at a premium. In consequence, he could afford to sell at a lower, rather than a higher, price than in former years.

This statement of the connection between exchange and price, however, is put forth merely as a suggestion of one factor, and probably a minor one, in the explanation of the different course of export prices in Argentina and Chile on the one hand, and Brazil on the other. It is a commonplace that in peace times South American exports, except for coffee and nitrate, constitute too small a proportion of the world stock to control the world price. Rather, South American export prices are dominated by the prices ruling in the principal markets to which the exports are sold. Much more was this the case during the war. Export prices, total value of exports, foreign exchange, rose in Argentina and Chile as the direct consequence of war demand for Chilean nitrate and Argentine meat, wheat, wool, and hides. It is at this point that one finds the explanation of the difference between the Brazilian experience and that of the other countries. The exports of Brazil did not expand for the reason that they were not the sort of prod-

ucts for which there was a war demand. At least, this is true of the pre-war Brazilian staple exports.

The bulk of the exports of Brazil has for years consisted of two products, coffee and rubber. For example, out of total exports of $313,628,000[1] in 1913, rubber and coffee comprised $248,579,000, or about four-fifths of the total. By far the most important single export is coffee, which in 1913 amounted to $198,157,000, or over 63 per cent of the total exports. Coffee is not a war commodity. The Allied powers therefore restricted its import. Even more serious is the fact that the large demand from Central Europe, amounting normally to about 4,000,000 bags a year, was cut off. In consequence, the United States was the only unrestricted market for Brazilian coffee, taking about one-half the total exports. Added to these pronounced restrictions of the demand for coffee is the fact that the Brazilian supply during the war was somewhat above the pre-war normal. The result was that Brazil had on its hands an increasing stock of coffee which it could not hope to dispose of until after the war.

This situation became acute almost immediately upon the outbreak of war, and led in 1915 to the reëstablishment of a valorization system, along somewhat different lines from the famous plan of 1907–08. The federal government by a law of 1915 authorized the issue of 350,000,000 paper milreis, of which a part was to be used for carrying out a new plan of coffee valorization. The paper money was lent by the federal government to the state of São Paulo, which has been conducting the valorization operations. The original plan was to prohibit the export of coffee above 6,000,000 bags a year; the 4,000,000 bags which in normal times went to Germany, Austria, etc., to be held in Brazil, the state of

[1] Figures are given in United States dollars.

São Paulo lending, in paper money, up to 60 per cent of a value to be fixed on a basis of past averages to coffee growers who deposited their coffee in warehouses; the warehouse receipts to be handed over by the state government to the federal government as collateral for the issue by the latter of the paper money. This loan feature was dropped, however, and instead the state of São Paulo undertook to purchase at an official price so much of the annual coffee crop as might appear sufficient to maintain prices, or, failing in that, so much as it might be able to purchase with the paper money funds supplied to it by the federal government under the laws above mentioned.

In 1918 the São Paulo government bought large quantities of coffee at the price of 4$900[1] per 10 kilos (i.e., about $1.24 for 22.4 lbs.). The ordinary market price, however, was lower, between 4$600 and 4$500. Interior shippers and planters demanded that their coffee be sold to the government, and the coffee Associacão of Santos presented a memorial to the government requesting a further issue of 300,000,000 milreis of paper money for additional valorization purchases.

The statement on page 457 indicates the coffee position up to May, 1918. The table indicates that of a total crop of 17,000,000 bags, about 13½ million actually came to market; of this quantity somewhat more than 7 million bags were exported, leaving the enormous quantity of 5,939,291 bags of the 1917–18 crop, and 1,100,000 bags of the 1916–17 crop — a total of virtually 7,000,000 bags, or as much as the total 1917–18 exports — in storage in Brazil and unable to find an outlet. The state of São Paulo, it is seen, was itself holding almost 2,800,000 bags, or almost 40 per cent of the total amount in storage.

[1] I. e., 4 milreis, 900 reis.

THE COFFEE POSITION, 1917–18 CROP[1]

	Bags
ands of São Paulo government, April 30, 1918.....	2,788,875
ands of commissarios and exporters, inclusive of 600,000 gs bought by São Paulo government.....	4,150,416
ped coastwise.....	281,000
rted up to April 25, 1918.....	7,325,665
Total.....	14,545,956
stock on June 30, 1917.....	1,100,000
Net total.....	13,445,956
ome down to complete estimated crop.....	3,554,044
Total crop.....	17,000,000

he fact is that the supply of Brazilian coffee was elessly in excess of the demand. The result was that pite of the large purchases by the government, the e of coffee in Brazil went steadily downward. Mean- e, as a result of rising freight and insurance rates ich are, moreover, additional causes of the diminu- . of exports) foreign coffee prices rose. The following e shows the price of Brazilian coffee in London and antos for the period 1911–18:

PRICE OF COFFEE, 1911–18[1]

Date	LONDON Shillings cwt.	SANTOS Paper Milreis 10 kilos = 22.4 lbs.
Oct. 16, 1911	66*s.* 9*d.*	8$600
March 26, 1911	62*s.* 3*d.*	7$900
" 1913	52*s.* 9*d.*	6$250
" 1914	41*s.* 3*d.*	4$750
" 1915	43*s.*	5$150
" 1916	44*s.* 6*d.*	4$900
" 1917	53*s.* 6*d.*	5$500
" 21, 1918	66*s.* 9*d.*	4$100

ata on the " coffee position " and on prices from Wileman's Brazilian Review for nd June, 1918.

midsummer of 1918 the purchases of coffee by the state of São Paulo amounted 0,000 bags. The congestion was further relieved by an arrangement made with the government by which 2,000,000 were purchased on behalf of France. The 1918– , at first estimated at 10,500,000 to 12,000,000 bags, was considerably reduced were frost in São Paulo on July 9, 1918. See Fielding Provost, " The Brazilian Situation," Pan American Magasine, September, 1918, pp. 225 et seq. On ber 6, 1918 there were 6,351,000 bags of coffee on hand in Santos and 884,000 in Janeiro, as compared with 2,825,000 bags in both places combined on the same 1917. Bulletin of the Pan American Union, October, 1918, p. 604.

The different course of Brazilian and foreign prices is apparent. After the initial fall to 41*s.* 3*d.* in 1914 provoked by the liquidation of speculative accounts that followed the Balkan war, London quotations moved upward with the increasing charges for freight and insurance. The course of prices in Brazil was just the contrary. Since October, 1911, when owing to reckless speculation prices reached the maximum in both the Brazilian and the London market, prices in Brazil, with the exception of a slight reaction in 1915, due to extraordinary activity in the trade with Scandinavia and the United States, dropped continuously, until at 4$100 per 10 kilos it is doubtful if they sufficed even to cover the cost of production.

The facts that have been presented — the restriction of markets, the decline of prices, the abnormal accumulation of stocks in Brazil — find their most convenient expression in the figures of coffee exports. The following table shows the exports of coffee for the years 1913–17. Both quantity and value figures are given:

EXPORTS OF COFFEE FROM BRAZIL, 1913–17

Year	Quantity (1,000 bags [1])	Value (U. S. $1,000)
1913	13,267	$198,157
1914	11,270	131,220
1915	17,061	156,443
1916	13,039	138,296
1917	10,605	112,033

Except for the reaction in 1915, it is seen that the trend of coffee exports, both in quantity and in value, was pretty steadily downward. The increased quantity exports of 1915, almost 4,000,000 bags greater than in 1913, is noteworthy. But because of reduced prices, the value figures of the 1915 exports were more than $40,-

[1] Bag = 132 lbs.

000,000 less than in 1913. After 1915 the decline in both categories is striking. The year 1917 was the low water mark. Quantity exported fell almost 6,500,000 bags below 1915, and the value fell over $44,000,000 below the 1915 figures, and over $86,000,000 below the 1913 figures, a decrease of 45 per cent. It ought to be said, too, that 1913 was by no means a normal year, exports of coffee being $28,114,880 below the 1912 figure.

A close second to the falling-off in coffee was the decline in exports of rubber, the other major export. The following table gives the quantity and value of rubber exported in the years 1913–17.

EXPORTS OF RUBBER FROM BRAZIL, 1913–17

Year	Quantity (Million tons)	Value (U. S. $1,000)
1913	36,232	43,223
1914	33,531	34,326
1915	35,165	34,214
1916	31,495	36,431
1917	33,980	36,435

Rubber exports show a decrease of 2,252,000 tons and $6,788,000, or about 16 per cent. The table indicates, however, that the decline took place in 1914; in later years the trade slightly improved.

The discussion of coffee and rubber indicates sufficiently the reasons for the failure of the Brazilian export trade to expand during the war; and in consequence, explains why, while the trade balances of Argentina and Chile have been rising phenomenally, the Brazilian balance has undergone but little change. The table on the next page compares the trade balances of Brazil, Argentina, and Chile for the years 1910–17.

The difference between the Brazilian situation and that of Argentina and Chile is apparent at a glance. Except for the year 1913, a year of unusually large im-

COMPARISON OF THE TRADE BALANCES OF BRAZIL, ARGENTINA AND CHILE, 1910–17
(U. S. $1,000)

Year	Brazil	Argentina	Chile
1910	$+73,000	$+20,125	$+11,439
1911	+68,000	−40,539	−3,497
1912	+54,381	+92,194	+17,881
1913	−12,397	+59,977	+24,379
1914	+55,792	+74,726	+10,920
1915	+109,910	+278,789	+53,625
1916	+71,310	+199,630	+103,456
1917	+74,674	+169,849	+127,178

ports, the Brazilian balance was favorable. Except for the year 1915, however, the balance in favor of Brazil in the war years was about of the same size as in pre-war years. Meantime the balances in favor of Argentina and Chile show a large increase. Relating these facts to the course of foreign exchange, it is not surprising that in Argentina and Chile, by reason of the great excess of supply of exchange, representing the exports, over the demand for exchange, to pay for imports, exchange experienced a phenomenal rise; whereas in Brazil, where there was no such change in the trade balance, there was no such rise of exchange.

What in fact occurred, as we have seen, was a pronounced fall of exchange; and the balance of merchandise trade, by itself, does not provide an explanation of the fall. As in the case of Chile, there are but few data on the other items of the balance of payments; but for what are by far the most important items, foreign borrowings and interest payments, a fairly trustworthy computation can be made.

Financially, Brazil fared worse than any of the other South American republics during the war. The outbreak of war produced an acute situation, the reasons for which go back a considerable space into the pre-war period. Brazil had for long been accustomed to a large

inflow of foreign capital. The six year period 1908–13, in particular, witnessed a program of heavy borrowing, both by the federal and the state governments, and by private enterprise. The following figures show the amount of new foreign capital annually invested in Brazil during the period 1908–16:

AMOUNT OF NEW CAPITAL IN BRAZIL, 1908–16 [1]
(U. S. $1,000)

1908.....	140,000	1913.....	202,727
1909.....	101,386	1914.....	.....
1910.....	163,936	1915.....	.....
1911.....	188,305	1916.....	5,500 [2]
1912.....	123,773		

The easy acquisition of foreign capital led the governments and private individuals into extravagances — into unusually large military and naval expenditure, into railway and other public projects which could yield a return only after some years of waiting. According to official statements, the revenues of Brazil for the five years 1910–14 totaled 2,762,008 contos (paper), while expenditures amounted to 3,514,155 contos, leaving the enormous deficit of 752,147 contos, or $238,123,000. During the first four years, 1910–13, the deficit was $159,123,000, or an average of $39,781,000 per year. In 1914 it was nearly double that sum. Owing to the war, the revenue decreased to 375,098 contos, while expenditures, tho considerably lower than in the preceding year, amounted to 636,781 contos, thus leaving a deficit of 261,683 contos, or $78,902,000.

The outbreak of war did more than cut down government revenue. It shut off the inflow of foreign capital which was at the bottom of the extravagant expenditure. The sudden cessation of investment in 1914, moreover,

[1] Translation in the Pan American Magazine, November, 1918, pp. 16 et seq., of an official statement by Elysio de Carvalho.

[2] $5,500,000 lent to the municipality of São Paulo by United States banks.

came after some rather trying experiences in 1913. Brazil was seriously affected by the stringency in foreign money markets which followed the outbreak of the Balkan War. The year 1913, moreover, witnessed a slump in coffee and rubber prices. The value of coffee and rubber exported in 1913 was nearly $56,000,000 less, altho the exports of coffee were over a million bags larger, than in 1912. Total exports declined from over $362,000,000 in 1912 to less than $314,000,000 in 1913. At the same time imports increased from about $308,000,000 to $326,000,000. The result was that in that year the balance of trade was unfavorable by about $12,000,000.

In consequence gold began to flow out of Brazil, and the exchange rate was threatened. In 1912 there was a net inflow of gold amounting to $17,500,000. In 1913, on the other hand, there was a net export of gold of over $23,000,000. Brazilian exchange would have fallen in 1913 from the high level of the 1910-12 period had it not been for the important service performed by the Conversion Office, which issued gold freely to maintain exchange, its gold holdings falling in consequence from 386.7 to 276 million milreis during 1913.[1]

When the war broke, the federal government was negotiating for a loan in London. The failure of the negotiations made it impossible for the government to pay interest on its foreign obligations. In October, 1914, an agreement was made with the foreign bondholders, represented by the Rothschilds, for a funding loan of £15,000,000.[1] The interest on the foreign debt was paid in the bonds of this loan up to August, 1917, when interest payments were resumed. Amortization of the foreign debt was suspended for thirteen years (until 1927). The effect of the funding loan was to take

[1] South American Journal, January 18, 1919, p. 37.

the weight of the foreign interest payments off the exchange market, temporarily, thus preventing a fall of exchange much more serious than that which actually did occur.

As it was, exports of gold increased to the high figure of $40,144,000 in 1914; and the stock of gold in the Conversion Office was reduced to 138.5 million milreis by the end of the year. In December, 1914, the President was authorized to suspend the redemption of notes until December, 1915, the suspension being subsequently extended. The government resorted to issues of paper money. The first issue, authorized by law of August 24, 1914, was for 250,000,000 milreis. A second issue, of 350,000,000 milreis, was authorized by law of August 28, 1915. By June 30, 1918, the total quantity of inconvertible paper in circulation was 1,534,252,000 milreis, representing an increase of 945,000,000 milreis since August 26, 1914.[1]

In other words, throughout the war Brazil has been on an inconvertible paper money basis; and the foreign exchanges have been subject to all of the fluctuation and unsteadiness which is inherent in every inconvertible paper situation, and of which the most interesting instance today is Chile. Large emissions of paper, moreover, have precisely the same effect on the rate of exchange as does an unfavorable trade balance. They affect unfavorably the ratio between the domestic paper and foreign gold moneys, by increasing the supply of the former relatively to the demand for it, and thus cause its depreciation in terms of foreign gold. Here, then, is undoubtedly one of the causes of the present low rate of Brazilian exchange.

[1] South American Journal, January 18, 1919, p. 37. At the end of 1918, the quantity of paper in circulation was stated to be about 2,000,000,000 milreis. Revista de Economia y Finanzas, pp. 609, 610.

Another cause is contained in the borrowing program which we have reviewed. The heavy borrowings have given rise to an increasingly heavy interest charge. According to Sr. Elysio de Carvalho, whose figures of new annual borrowings were given above, p. 461, the total foreign capital invested in Brazil was in 1917, $2,000,000,000.[1] Of this sum $577,240,000 is the foreign debt of the federal government (December 31, 1917), and $301,116,376, the foreign indebtedness of the individual states and municipalities (December 31, 1916); the remainder, or $1,122,000,000, representing private investment. The annual interest charge on the federal foreign debt is about $30,000,000, but owing to the funding agreement, which did not end until August, 1917, only $11,993,506 was paid in 1917. Interest on all other foreign capital ($1,423,000,000) at 5 per cent equals $71,150,000; the total interest charge in 1917 was thus about $83,144,000. When this sum is added to the imports ($216,319,000), we have a total of outgoings from Brazil of about $299,463,000, as against $290,993,000 of exports. The favorable trade balance of $74,674,000 (shown on p. 460) is thus converted into a deficit of $8,470,000. Had the full interest charge on the federal foreign debt been paid, the balance would have been much more unfavorable.

To sum up the discussion of Brazilian exchange, the suspension of specie payments by the act of December, 1914, the large emissions of inconvertible paper money since that date, the sudden shutting-off of the large annual inflow of foreign capital by the outbreak of war, which brought upon Brazil the full burden of the interest charge — these factors, combined with the serious shrinkage of the exports of coffee and rubber and the

[1] Of the total amount $1,750,000,000 is European. Of this $705,000,000 is English, and $600,000,000 French. Pan American Magazine, November, 1918, pp. 20 et seq.

consequent failure of the export trade to expand, as it has done in other countries, brought it about that whereas in the other countries exchange rose remarkably, in Brazil the level of exchange during the war was considerably below the level of pre-war years.

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POSITIVE CONTRIBUTIONS OF SCIENTIFIC MANAGEMENT

THE ELIMINATION OF SOME LOSSES CHARACTERISTIC OF PRESENT-DAY MANUFACTURE

SUMMARY

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I. Introduction

Today, when present and impending conditions are trying men's souls and forcing a weighing in the balance of their past achievements in so many directions, it seems appropriate and important to make at least a partial appraisement of the contributions of scientific management to the field of industrial problems. It may be well, however, at the start to look back briefly over the successive stages of its development in order to arrive more fairly at a true estimate of its present value, and to enable a correct forecast of its potential worth as a means for the adjustment of present and future social and economic problems.

As long as the early discussions and the evolution of the science were confined within the bounds of the American Society of Mechanical Engineers, the public knew little of what was taking place. This was as it should have been, for the early papers [1] which stimulated discussion and really crystallized and forced the concrete statement of principles and methods, later served as the substantiation of the most potent claim of scientific managers — namely that scientific management is not a *theory* evolved on paper by a more or less practical dreamer, but is the result, tho as yet imperfectly expressed, of carefully worked out solutions evolved by far-sighted and eminently practical managers and engineers to meet everyday problems. Such theory as has been developed was preceded long years by sound practice.

With the Eastern Rate Case hearings in 1911, however, came the second stage, the public awakening; and immediately succeeding it came a flood of popular articles, extravagant claims, and vehement denials. There was a mad scramble on the part of various owners of industries (possessing a lamentable lack of understanding as to what this new movement really was) to secure this " panacea," and of course an equally eager readiness on the part of incompetent and frequently unscrupulous charlatans to supply the demand. It is safe to say that had not such abundant evidence of the real value of the fundamental *principles*, properly applied, been available during this period, the inevitable

[1] Towne, "The Engineer as Economist," Trans. A. S. M. E., vol. vii, p. 425; Towne, "Gain Sharing," ibid., vol. x, p. 600; Halsey, "A Premium Plan of Paying for Labor," ibid., vol. xii, p. 755; Rowan, "A Premium System Applied to English Workshops," Proc. Inst. of Mech. Eng., March 20, 1903, p. 203; Taylor, "A Piece Rate System," Trans. A. S. M. E., vol. xvi, p. 856; Gantt, "Bonus System for Rewarding Labor," ibid., vol. xxiii, p. 341; Taylor, "Shop Management," ibid., vol. xxiv, p. 1337. Gantt, "Graphical Daily Balance in Manufacture," ibid., p. 1322; Barth, "Slide Rules as Part of the Taylor System," Trans. A. S. M. E., vol. xxv, p. 49; Dodge, "A History of the Introduction of a System of Shop Management," ibid., vol. xxvii, p. 720.

reaction would have been much more severe and of much longer duration. The fact that it was not is only another tribute to the (possibly unconscious) far-sightedness of the real leaders in the movement.

For there is no question that the reaction is largely past and that we are now in the third stage. This does not mean, however, that there is not still a tremendous amount of misunderstanding as to the real significance of the movement, or even a considerable amount of active opposition. The third stage is again clearly reflected in the literature on the subject. The popular matter has dropped out pretty completely and has been replaced by an already large and constantly growing number of articles dealing, on the one hand with concrete illustrations and explanations of the actual workings of the system or of parts of it, and on the other hand with frequently altogether healthy and well-intentioned, tho unfortunately not always well-informed, attempts to appraise its true economic significance. The active and open opponents, failing to find proof of the fulfillment of their dire prophecies as to the ill effects on the workman and the heartlessness of it all, have largely been driven to a less outspoken if more insidious activity, unwittingly furnishing tremendous arguments for the extension of what they sought to kill through measures forced on misinformed legislators in a vain attempt to stop the inevitable.[1] And incidentally, those of the

[1] I refer to the anti-stop watch and premium-payment riders to the Army Appropriation Bills. Before the Committee on Military Affairs on January 4, 1917, Brig. Gen. William Crozier, Chief of Ordnance, in discussing the Taylor System at the Watertown Arsenal submitted testimony in substance as follows, Hearings before the Committee on Military Affairs, Army Appropriation Bill, 1918, pp. 955–964; see also Congressional Record for February 1, 1917, pp. 2654–60: —

After the Taylor System had been in operation at the Arsenal a year or more a comparison of identical jobs showed that the men on the average did 2.7 times as much work after its development as they did before. In the machine shop where most of these jobs were done, the average increase in output was 2.2. (See decrease for this department upon abolition of premium payment, below). The work was more carefully done, of a higher quality. There had been to date of testimony, January 4, 1917, some

Taylor persuasion — upon witnessing the constant putting forth, by those either ignorant of or actually opposed to the Taylor System as such, of "new" and brilliant ideas in management, incorporated long since in the practices of that group — may be pardoned for an unseemly chuckle up their sleeves at the rapid and irresistible spread of the principles and methods for which they have long stood. Not only in current trade journals laying no claim to being scientific management disciples, but also in the practices of many managers, some of whom at least lay claim to being exactly the reverse, is this tendency most noticeable. Only upon coming in more or less close contact with numerous plants is this fact brought home so forcibly.

We may say, therefore, that the sensational and propagandist period is past, that the foisting of half-baked "efficiency" schemes on an unsuspecting and overeager public is rapidly passing (altho there are still, unfortunately, too many managers who give less attention to the selection of an industrial adviser than they give to the purchase of a new machine), and that the skeptical stage — the "my business is different" atti-

seven years after the system was inaugurated, no single instance in which a man had complained of overwork. The spirit and contentment of the men had never been so good as they were during the several years in which the system was in operation. For a number of years the average earning of premiums of the workmen, above the regular day wage which in itself was equal to that of other plants in the vicinity, was about 27 per cent of their pay.

By congressional action the use of the stop watch and the payment of premiums were abolished. A comparison of identical jobs done in many cases by the same workman both before and after this proviso went into effect shows in the worst case, that of a job done by the same man, that he took 4.2 times as long to do the work after premium payment was abolished; in other cases the ratios were 3.6, 3.0, 2.9, etc., with average ratios as follows:

Machine shop	2.2	times as long when not on premium
Foundry	1.6	" " " " " " "
Smith shop	2.1	" " " " " " "
Yard gang	1.8	" " " " " " "

The atmosphere of industry and application which was previously so noticeable changed materially, there was much more loafing and the men had no desire to exert themselves after premium payment was abolished. The earnings of the men of course dropped back to regular day rate, and the cost of manufacture was considerably increased.

tude — is gradually passing with the constant addition of new lines of industry to the list of scientifically managed plants,[1] and that we are now in a period of healthy growth accompanied by a much more sympathetic and truer understanding of the fundamental nature of the principles and problems involved. "Scientific management" has comfortably taken its place among the things which are here to stay.

It is perhaps a little early to attempt to judge of many of the economic problems raised by scientific management — the smoke of battle is yet a little too pungent, and we are not yet sufficiently removed from its beginning to enable us to get a true perspective of the movement as a whole. Whereas in the past, however, it has been necessary to speculate as to its *probable* effects on this or that phase of the problems presented, and even tho we may still justifiably concern ourselves in this manner with the numerous as yet unsolved questions, we can now, nevertheless, get a much clearer perspective than has been possible heretofore and perhaps more profitably focus our attention on the *positive* aspects and accomplishments in certain directions, realizing that it is no longer theory but facts with which we are dealing. If the writer succeed in crystallizing a few of the accounts on the debit side of our balance sheet by bringing together some of the concrete economic losses already eliminated or alleviated by scientific management, it may perhaps make easier our minds as to the state of the science as a whole.

In considering the effects of scientific management from the standpoint of its positive contributions to industry we may take up first the mechanical phase — the more purely impersonal aspects — divorced so far

[1] Cf. C. B. Thompson, "Scientific Management in Practice," Quarterly Journal of Economics, February, 1915, p. 262, in which eighty-three different industries are listed since which time there has been a noticeable increase in the number.

as possible from considerations of its direct effect on the individual, leaving the human factor as the last and most important topic. The two are to a certain extent interactive, yet sufficiently distinct to warrant separate treatment.

II. The Mechanical or Impersonal Aspects

A. *Increased Production*

Turning first then to the effects of scientific management on industry as such, as exemplified by those establishments directly affected by it, by far the most striking single fact is the *increase in production* it has effected with the same equipment and personnel. This has occurred in many cases to such an extent as to be almost unbelievable. Ten, twenty, thirty per cent increases are the rule, and an output twice or even three times as great as had formerly been secured is not uncommon. And these results have not been uniformly secured, as might be supposed, from plants that were near the lower level of efficiency before the development of the system was started. On the contrary, in many cases the standard of production was comparatively high, and I know of one case where the production was increased over 60 per cent in a plant which from every standpoint was previously generally considered to be absolutely the most efficient of its kind in the country. The desire for increased production is often, indeed, one of the minor causes for the management's determination to have scientific management — too often the output is greater than ever before and yet the firm through other causes is losing money, or conditions are unsatisfactory in other respects.[1] But in just that same plant when scientific

[1] Witness a recent demand on the part of workmen in one large shop for the initiation of time study as a means of more accurate rate-setting.

management *is* developed, the output is almost sure to increase — incidentally as it were.

Increase in production has been the cry of economists for centuries, and for centuries they have had their cry answered — at least partially. For it is the exception where, take any industry you will, with the *constant substitution of new and improved labor saving machinery and equipment* the output has not been very largely increased over what it formerly was. Our industrial highway is strewn with the corpses of those individuals who would not or could not keep abreast of these improvements.

Such increases, however, altho they may enable the individual to survive, may not and often do not wholly satisfy economic demands. They are brought about by the *substitution* of new machines for those already in use, oftentimes long before the latter have earned their keep. I heard of a case where recently in one department, new machines costing thousands of dollars and having been in use less than one year, were scrapped to make way for new and supposedly superior machines.

The increase in production brought about through scientific management, however, is of a fundamentally different nature. True, the scientific manager does not tolerate obviously antiquated machinery, but he does not tolerate inefficient machinery of any kind, and it is just here that his real economic contribution comes in. With him it is not a case primarily of increase in production through new machines; it is first and foremost a case of increase through *getting the most out of existing equipment* and personnel. Only after present means are brought to their highest productiveness may the question as to whether new equipment is justifiable be satisfactorily determined. With the present mania for new equipment, we may well inquire whether, in very many cases, these changes do not impose an added rather

than a lessened burden on the consumer. If a proper charge for such rapid obsolescence as well as a regular charge for depreciation were figured into the expected cost resulting from the contemplated "improvement," and particularly if this expected cost were compared not with present costs with existing equipment, but with what those costs *should be*, it is safe to say that many new machines would go unbought, that many firms would avoid bankruptcy, and that the owners as well as the buying public would profit thereby. It is just here that the line between the two kinds of increases may be sharply drawn, which brings us to the consideration of the financial aspect of the question.

B. *Decreased Cost*

For all practical purposes the consumptive capacity of mankind as a whole may be considered to be unlimited. Yet not infrequently there has occurred a state of so-called "overproduction" in one or more widely consumed lines of commodities. This apparently anomalous state of affairs will be found, upon analysis, to be due not to overproduction as such — not to a simple cessation of demand because of satiated desire — but to a conviction on the part of the consuming public, that *at that price* under existing conditions the commodity in question no longer yields the demanded return for money invested in it. What was formerly exchanged for this commodity now goes elsewhere where the equivalency is considered to be more attractive. Lower your price on this one commodity, however, and see what happens: — the balance of equivalency just established is again disturbed, the commodity now immediately represents a relative increase in return, those articles which before replaced it are now themselves re-

placed by it, and we get back at least to the original state of demand with possibly an added demand. Continue to lower the price, and this commodity will continue to edge its way into favor, constantly disturbing the balance and in constantly widening circles continuing to replace other articles which we deem, in comparison, as of lesser utility.

It would then seem clear that a simple increase in production without at the same time a decrease in unit cost (and therefore, in the long run, in selling price) cannot of itself in the great majority of cases be considered an economic gain [1] and may at times lead to a direct economic loss — overproduction. Furthermore, a simple increase in production with an accompanying decrease in a cost which, due to inefficiency in management, was hitherto higher than it should reasonably have been as judged by modern standards, may not and usually does not wholly satisfy economic demands. It is only erasing the negative and getting back to par, as it were, but failing to add a plus.

Where the increase in production and the decrease in already satisfactory cost go hand in hand, however, our gain is direct and indisputable.

It was for this reason that the distinction above was drawn, and it is on this ground that scientific management may lay just claim to a more favorable economic judgment than the prevalent increase in production brought about through new equipment which may not be economically justifiable. With its insistence on present efficiency before new equipment is permitted, which with its accurate cost system furnishes a basis for determining the effectiveness of contemplated substitutions,

[1] I am not considering those rare instances where an increase in production with decreased cost may be an economic *loss* (in the case of whiskey, e. g.), nor where an increase in production even at a decided increase in cost may be a distinct economic *gain* (in the case of food shortage, e. g.). Such cases are altogether exceptional and have no practical bearing on the present discussion.

scientific management has a very much firmer foundation upon which to rest its claim. It of course has also the absolute reduction in cost in addition.

Of the various *means* by which scientific management increases production and decreases cost, some — such as the selection, fitting and training of the workers, the reducing of labor turnover, absences, lates, etc., the determining and securing of a proper day's work and the paying of a correspondingly increased wage — are distinct economic gains in themselves. These will be discussed under the human factors. Others, however, must be considered simply as the elements which go to form the most outstanding contribution of scientific management under this head — decreased cost — and as such several merit discussion here.

1. *The Use of Equipment.* Closely connected with the question of new equipment referred to above, is that of the full utilization of that now on hand, using the term in its widest sense to include all facilities of production.

A certain amount of idleness of equipment is of course unavoidable. That it should be even one-half of what it unquestionably is, however, is a striking commentary on the lack of foresightedness of many managements. The encouraging feature about it, however, is that a large proportion of idleness can be prevented and that a few progressive managers are informing themselves and taking effective steps to remedy the evil. Less encouraging is the fact that the extent and seriousness of the losses through idle equipment are seldom appreciated by the manager until it is brought forcibly, even violently, to his attention through cold figures. In comparatively few plants is a record of machine time regularly and systematically kept, and in still fewer instances is the effort made to determine in each case the exact cause

of idleness upon which to base intelligent remedies. If, as advocated by Mr. Gantt,[1] each manager could be shown that during the last two months a certain group of machines was idle say 40 per cent of the time, and that this idleness was distributed as follows:

TOTAL IDLENESS		40 %
Unavoidable breakdowns		3 %
Avoidable breakdowns		12
Lack of work at machines		15
Lack of orders for product	0	
Lack of materials	4	
Unbalanced equipment	6	
Poor planning	5	
Lack of help		10

and if in addition the money loss from each cause could be shown, measures to reduce the idleness would follow almost as a matter of course. Nothing is more common than an abundance of room in what was previously a very much crowded and overburdened department after steps have been taken to balance, rearrange, standardize and maintain equipment, and it is not unusual to hear of a whole contemplated addition to a plant being found entirely unnecessary and consequently abandoned upon the presentation of such statistics as those cited above — a direct saving of usually thousands of dollars, to say nothing of the avoidance of actual loss (through decreased production or increased costs) which many times occurs with an enlargement of plant.

Just why such conditions exist it is hard to say. Attention to such matters should be one of the main duties of the manager. And with a table such as the above, he would soon make them his principal duty. Yet, even

[1] H. L. Gantt, "Productive Capacity as a Measure of Value of an Industrial Property," Trans. A. S. M. E., 1916.

under present conditions, it seems so much easier to order new equipment, blame the seller for such slow deliveries that our production is held up, and overlook the fact that by the aid of such facts the way out lies right under our noses. The answer probably lies somewhere between our natural aversion to real thought and planning, and the fact that the prevalent forms of organization keep the manager so hemmed around with ordinary routine that he is left no time in which to conceive and execute manifest reforms. The exception principle in management emphasized by Mr. Taylor, merits a much wider application on the part of most of our executives.

2. *The Use of Labor.* Unlike an idle machine, there is of course no such thing as an absolutely idle man permitted in any plant, yet a man who, before thoro time study and planning might be considered to be extremely busy — as indeed he might be, tho perhaps inefficiently so — in the light of highly systematized working conditions would be thought of as having been previously very ineffectually employed. The term "idle" is becoming a relative one. In general, except as the human element, to be discussed, enters here, the same conditions as pointed out for idle equipment are applicable in this case, and for the present the two may be considered as of like nature and effect. Taken together they constitute the most tangible field for reducing costs.

3. *Material Control.* The stores system in a scientifically managed plant is typical of the minute control designed to be exercised over all departments of the work. It is designed to cover the four factors covering the efficiency of material use: Quality, Quantity, Time, and Cost, and great care is taken to maintain the proper balance between these four interdependent variables so that their resultant effect will be the best for any given case, all things considered.

It is not the purpose of this general review to go into a description of either the methods or the exact results of the various means by which modern management's economic contributions are made. To do so, even for the present topic, would require volumes. Only the broader features can be briefly touched upon. In general it may be said that the principal losses in the materials field occur on the one hand through oversupply, and on the other through undersupply; and curious as it may seem, losses from both sources occur most often in the same plant.

It is the exception where the cost of installation of the stores system does not pay for itself by immediate savings effected, and in many cases these savings arise largely through the elimination of surplus stock and useless varieties, and through effecting a more rapid turnover. In fact, reports as to the amounts of junk disposed of in various plants upon the development of the stores system would be almost unbelievable to one who has not had first hand contact with this work, were it not for the records supporting the statements. Tons and tons of supplies — ordered by the foreman for the expected rush which did not materialize, parts lost or rejected in process, duplicate orders uncaught, "rainy day" and spoiled parts cached by the workman, wrong material delivered and not sent back, parts for discontinued products, and fantastic variations from standard — all accumulate in the storerooms or at various odd places (including valuable working space) throughout the plant, until a detailed study of production requirements leads to a wholesale housecleaning. Immediately and almost invariably, the inventory of stores which it is necessary to keep on hand is decreased, releasing idle capital. This capital invested in turn becomes more productive through more rapid use.

The experience of the Watertown Arsenal where, upon the development of the system, the savings in one year resulting from the use of *surplus* stock amounted to $122,789.61 is typical of many, many plants in this respect. Similar instances could be multiplied almost indefinitely.

Looking behind such conditions we readily see not only the general disorganization and lack of knowledge thus typified, but also the large amount of capital tied up, the inevitable depreciation and deterioration of stock, and the general interference with the flow of work in productive processing. Add to this the elimination of the generally rapidly disappearing annual or semiannual shutdown for inventory taking, and the sources of the large savings become apparent.

Similarly, lack of the proper material at the right time is frequently the cause of expensive delays, postponed delivery dates and even loss of trade. Here again a certain amount of lost motion is unavoidable; but that four-fifths of the current inconveniences and losses experienced in material handling can be eliminated by detailed knowledge and proper planning is proved by those scientifically managed plants which have systematically attacked and regulated stores problems.

4. *Routing.* The decreasing of costs through the full utilization of equipment, of men, and of materials has been discussed. Another of the means by which this reduction is secured is the broader use and correlation of the business as a whole, including both the physical layout and the administrative control of the various component parts of the business.

Just what is meant by this topic, as well as its significance, may be illustrated by an example. In modern or scientific management a factory is looked upon from the

strictly production standpoint as comparable to an automatic machine. Just why this conception is necessary may be seen from considering a compound full automatic consisting of five successive components, A, B, C, D, and E. As a piece is completed in any one of these parts, it is automatically swung around to be further processed in the next, and obviously that next must be free of its previous piece and ready to receive the new. Properly to set up such a machine of course requires detailed knowledge of and strictest attention to the time element for each head.

Now, a great many plants are being run today without an appreciation of the fact that the various departments of the plant as a whole are exactly analogous to the various parts of the automatic machine. The result is very much like the result would be if the automatic were set up either by one man who lacked or disregarded knowledge of all parts except that he was working on at the time, or by two men working independently without the knowledge of what the other had done, was doing or expected to do. In the case of the machine its various parts simply must be correlated and brought into proper synchronism by one man or by concerted action if by more than one; the same thing is less obvious but equally true in the case of the interdependent departments of the manufacturing plant if equally satisfactory results are to be expected. The "set up" and regulation of the various departments of most factories is an exceedingly complex and technical undertaking commonly defined by the term "routing," and not for a moment can any one foreman be allowed to run his department as he sees fit regardless of its relation to other departments and to the business as a whole. Hence the insistence in scientific management on a somewhat elaborate Planning Department, or at least

on a central control of all activities which in any way have an interacting effect, and conscious and constant effort is put forth to secure this central control. As perhaps the finest example of the practical application of what has here been incompletely described, reference is made to the work of G. D. Babcock in the plant of the H. H. Franklin Manufacturing Company.[1] Suffice it here to emphasize the point that such control is the cardinal aim of every scientific manager, more or less perfectly realized in the best shops and secured through the systematic collection of all relevant information and through the practical application of this knowledge through measures collectively known technically as "control." This control is established through the proper use of such measures as standardization, time study, logical layout, careful routing of work and first-piece inspection, mnemonic symbols, the Order of Work and the Bulletin Board or its equivalent — all mechanisms which, in one form or another, have become integral parts of modern management.

5. *The Regularizing of Production.* Perhaps nowhere better than in the elimination of seasonal production and its attendant evils is the fact illustrated that what is of permanent benefit to the management also benefits the workmen, and *vice versa*. It would in fact in this case be difficult to say to whom the larger benefit accrues — to capital and the consumer through full and continuous use of a minimum of plant, equipment and personnel, or to the body of employees through full-time employment and regular wages. Operation under conditions of seasonal fluctuations is a direct economic waste to the community, and that in very many cases it is not an unpreventable waste has been amply proved by those industries which have attacked and eliminated

[1] Babcock, G. D., The Taylor System in Franklin Management.

the evil. It would of course be folly in this case as in so many others to claim any monopoly of effort along this line for scientific management plants — the case simply illustrates what may be accomplished along so many lines by what scientific management does make it a *definite policy* to do: a policy of conscious and continuous *taking thought* of the numerous economic and social factors which make for permanent success.

C. *Improvement in or Maintenance of Quality*

Next to increased output and decreased cost, the question of quality of output deserves attention, for obviously, while in cases improvement in quality may be justified even with decreased production and increased costs, the reverse would infrequently be the case.

That the increases in production under scientific management have not been secured at the expense of quality would seem proved, if proof were needed, by the permanence both of those increases and of the firms which have secured them, and will be questioned by no one acquainted with the facts. As a minimum, the maintenance, at least of the engineer's " good-enough-is-best " quality, must be the first concern of those who expect fully and permanently to benefit by modern methods of management. It has remained largely for the time study man and the instructor, supported by proper quality bonus and thoro inspection, however, to prove that as between speed and quality there is not only no intrinsic irreconcilability, but indeed that with intelligent handling an improvement in quality usually accompanies increase in speed. Just why this is so may be left largely to the psychologists — we are here dealing simply with the abundantly proved fact.

D. *Speedy Production and Accurate Delivery*

It must never be forgotten that any industry, to remain in operation, must produce a profit. When it ceases to do so it loses the support of the investor and must perish. As a corollary to this it must be borne in mind that investments in plant, in materials, and in labor become bills receivable only when the finished product is shipped from the factory door. This shipment date then becomes one of the vital points of contact between seller and buyer — the earliest point ordinarily at which *expense* becomes convertible into *profit*.

The quoting of a minimum time necessary for delivery after the receipt of the order and the strict adherence to the specified delivery date are two commonly unappreciated factors in business success. From the buyer's standpoint they are outranked in importance only by quality, and oftentimes not even by that quite frequently intangible and relative characteristic. As between two reputable firms whose selling prices are not at too wide variance, the duration and definiteness of the time for delivery become governing considerations, and not infrequently indeed delivery outweighs both quality and price. The firm which, on a basis of knowledge and through the systematic measures of control discussed above, can accurately predict and rigidly maintain delivery dates is not only in an enviable position from the buyer's standpoint but may claim a distinct contribution to itself, to the buying public, and to the community at large.

For every cessation of processing operations for lack of material, every delay due to machine breakdowns, every loss of production due to discontented or absent workmen — every interference with high production

from whatever cause in our factory — is an economic loss; every failure to meet scheduled and attainable delivery dates (regardless of whether thereby the purchaser's schedule is also upset for in any event *our* turnover is less rapid than it should be and our costs must be higher than they should be) — every performance below a standard which, as gauged by current and freely available modern practice, may be reasonably expected and justifiably demanded, is an economic loss which must ultimately be paid for by the consumer.

The quickening of production and the consequent increase in rapidity of turnover, the informed and detailed control of work in process, and, resulting from these, the quoting of a quick and dependable delivery date — these factors characteristic of properly managed plants together constitute a decided antidote to the tendency for ever increasing costs of living.

E. *The Power and Stimulus of Knowledge*

As a final consideration under the industrial or non-human aspects of the discussion must be mentioned, partially by way of summary, the numerous factors which considered as a whole form the possibly less tangible but nevertheless eminently comforting features of operation under scientific management. I refer to the confidence, the sense of security, the power and stimulus, the aplomb which springs from the knowledge that we have *real control* of our business through the ordered regulation of its activities according to adequate knowledge and best practice — one of those by-products of Scientific Management which are often of such transcendent importance.

There is something immensely stimulating about it all, something akin to the inspiration and confidence we

feel when in the presence of a man who is a master of his subject and whose opinions and actions we know are based on thoro knowledge and thoro understanding. Who has not experienced the enthusiasm which comes with the final solution of an intricate problem; who has not experienced the stimulus of directing interdependent forces in perfect confidence toward a solution which, be what it may, we know must be the proper one because arrived at through absolute adherence to natural law. In the one case it is the enthusiasm of the chemist when he knows he has ferreted out a new element; in the other it is the confidence and the power of the master at his work.

This enthusiasm, this stimulus is nowhere more infectious than in industry. Striking proof of this is afforded by the avidity with which the " efficiency " gospel has been bandied back and forth between adherents and opponents during the eight or nine years it has been public property, and by the readiness with which very many of the largest and most progressive firms in the country have accepted and successfully applied the principles of modern management. It is fortunate that this is so, for in the search for and utilization of better methods wherever found lies the hope of American industry. The metal working industry generally has been tremendously spurred forward not only by the development of high speed steel, but also by the example of those plants which have not been content with being forced to adopt this means of increased production but which have voluntarily followed this measure up with others of far-reaching importance, and who have thereby postponed in their cases the time of diminishing returns. Tho lacking the same stimulus, there are increasing signs that the textile and other industries are shortly due for a less revolutionary yet none the less peremptory

awakening. They also must catch up with the, as yet, comparatively few examples of advanced management among them.

The fear of the power of knowledge even more than that of the power of capital may well cause competitors to demand forthwith a balance sheet of knowledge. Tho capital is needed to put knowledge to work and to keep it there, capital without knowledge is likely quickly to disappear in competition with those who possess both. Knowledge without capital is a stronger asset than is capital without knowledge, for knowledge may be capitalized while capital cannot be educated. We may well pause to consider our probable future status when our competitor and not ourselves is one who knows how long work should take; who knows the capacity of each machine, of each department, and of his plant as a whole, and who takes measures to see that these various factors are properly balanced; who has worked out, standardized and reduced to permanent form the best methods of performing work; who really knows costs (as far as from their very nature they may be known) and knows at how low a figure he can sell in dull times and still make a profit or secure more work to keep his organization and plant intact even at no profit, and who knows when he does quote a specified selling price whether he is losing money on the sale or not. We may well consider our relative positions when he is the one who knows that there is no inherent inconsistency between wages plus and cost minus, because he knows, appreciates and acts on the fact that "maximum prosperity for the employer, coupled with maximum prosperity for the employee ought to be the two leading objects of management." Such a competitor, we know, really *controls* his business and has a check on its efficiency — we are but alchemists, he is the chemist of industry.

III. The Human Factor

Just as increased production may be frowned upon if unaccompanied by decreased cost of the product and either of these may be censured if thereby quality is allowed to suffer, so none of these accomplishments can be commended or tolerated if at the same time labor — the human element — be not kept in satisfactory adjustment and correspondingly benefited.

Important tho it be for the country at large that we have high production and low costs, that we establish a strong industrial basis, it is of greater importance that while we are making *things* we do not forget that our first and infinitely more important duty is the making of *men* — of good citizens.

Scientific management has from the first been a storm center around which questions of labor have raged. Because of its effects in so many particulars on human relations it must continue to be so.

Time and space might profitably be given to showing how, in the evolution of scientific management, more and more emphasis has been placed on the necessity of maintaining just human relations and of promoting the best interests of all concerned; how the very structure of the mechanism itself is designed to safeguard, to increase and to satisfy those interests; how its very nature is such that, so far from militating against those interests, it is vitally dependent for its very continuance on a proper maintenance of them. Certainly such considerations must prove of vital interest and concern to anyone who deplores and looks beyond the present troubled days. Profitable and interesting as such a story might be, however, I believe it to be still more profitable and pertinent to summarize, even somewhat categorically,

some of the specific accomplishments known personally or through reliable authority which show in concrete cases the embodiment in actual practice of the theory and principles of scientific management. A theory may be ever so beautiful in the abstract; to judge of its soundness we must examine its results in practice.

Before turning to the discussion of concrete cases, it should be remembered that in considering the relations between industry as such and the individual, one is dealing with questions of tremendous significance and complexity. Many of the unsatisfactory conditions under which we work today are heritages of an age long past, just as many of the more satisfactory conditions today are in turn the successors to those once less satisfactory. The massing of workers, the economic dependence of the employee on the employer, the specialization of processes and the minute subdivision of labor, the aggregation and power of capital — the problems and ills of the individual arising through such factors have not, as is sometimes intimated, been brought on *by* scientific management; they are inherited problems and abuses with which, in common with other agencies, scientific management must deal. There is and can be no panacea for industrial ills — industry is not such a static thing as to make possible any such consummation. No movement can be justly judged from this standpoint — it must be judged according to the vigor and success with which it attacks and solves or ameliorates such unsatisfactory conditions as it may encounter under given circumstances. In the case of scientific management then, our inquiry must be, not whether it has completely solved partially unsolvable problems, but whether it is entitled as its exponents claim to be ranked as a movement which, as a cardinal principle makes a vigorous attack upon these problems

a definite part of its policy, and which is in fact, perhaps more than any other one agency contributing in a substantial degree to their satisfactory adjustment. It is from this standpoint that the following discussion is offered.

A. *Industrial Peace*

It would be impossible to say to what one feature the freedom from "labor trouble" characteristic of plants operating under scientific management has been most due. Certainly no one feature in itself has brought this about, and probably not any one feature has been most potent, for high wages is by no means everything for which the workman looks to the management. The absence of labor unrest is due undoubtedly to a combination of causes — to increased personal individual production and improvement in quality with the resulting personal satisfaction; to high wages unaccompanied by overexertion; to individual and impartial opportunity, assistance, recognition and reward; to an adequate machinery for the speedy adjustment of grievances; to conditions of work, of pay and of opportunity measurably better than the labor union in neighboring plants of the same type has been able to obtain and at the same time to an absence of ultra "welfare work" and similar measures which smack too much of paternalism and which tend, the workers feel, unduly to lighten the weight of their pay envelope. It is due to a spirit of coöperation — the "mental revolution" which is such a vital part of scientific management — to fair dealing, to a proper work environment, to a spirit of democracy, and to a feeling on the part of the employee that his best interest is being and will be looked after. It is due in fact, to the various factors discussed above and yet to be discussed considered collectively — it is inclusive of them all.

Summarize the causes as we may, however, the fact remains that in scientifically managed plants there has been remarkable freedom from the turbulent and distressing manifestations of industrial maladjustment characteristic of the last four years. It would be too much to expect that they could entirely escape the epidemic of industrial unrest, but it is extremely significant that, so far as is known through broad inquiry, such disturbances as have occurred have been of an altogether minor character, quickly and satisfactorily adjusted.

This fact is of preëminent importance at the present time. It is unquestionably *the greatest* contribution of scientific management — all the more so because secured, not as industrial "peace" was secured during the latter period of the war by governmental *suppression* of the disturbance of industrial conditions by either labor or capital, but by *coöperation*, justice, and fair dealing.

B. *High Wages*

It has sometimes been claimed that, in the cases of certain profit sharing and other measures, daily wages have been depressed below the market rate in the exact ratio in which profits were to be shared. Whether the claim is well founded does not concern us here. So far as the writer knows, this accusation has never been laid at the doors of Scientific Management. That it is not likely with justice ever to be is due to the dependent relation between daily wages and output. Starting with a current base rate of pay and the normal amount and quality of work customarily delivered by the operatives for that pay, scientific management first takes measures by which that production or that quality, or both, may be increased. Having thus provided the possibility of

higher and better production, it then offers, as a matter of justice as well as of necessity, a correspondingly increased incentive for its accomplishment, payable at once regardless of whether or not during any given period a profit is made on the business as a whole. Each is necessary to maintain the other, and the increased wage is solely dependent on and must follow immediately, not precede, increased output.

Increases in the earnings of operatives working under scientific management are too common and well known to need repetition here. Bonus percentages, above the prevailing market rate of wages, vary from 20 per cent to 40 per cent or higher depending on the character of work, and on the average are earned on from perhaps 70 per cent to 90 per cent of the jobs worked upon.[1]

That the more progressive managers are beginning to question the prevalent empirical bases of wage determination and to seek for a more satisfactory basis is evidenced by an attempt on the part of several of them to reduce to formulae the effects of various factors previously wholly neglected or only empirically estimated. Thus Babcock [2] takes into account the following factors:

1. Rate of production.
2. Cost of living.
3. Number of processes workman can do.
4. Years of connected service.
5. Fixed charges rate per hour which man has chance to modify.
6. Percentage of premium earned.
7. Late or absence record.
8. Spoiled work.

[1] For typical records see Hearings before Special Committee of the House to investigate the Taylor and other Systems of Shop Management, vol. iii, p. 1502; Congressional Record, February 1, 1917, pp. 2655–57; Thompson, S. E., "Development of Scientific Methods of Management," Trans. A. S. M. E., vol. xxxix, p. 123.

[2] Babcock, G. D., The Taylor System in Franklin Management.

9. Percentage of time under task.
10. Coöperation and conduct.

Such an attempt shows careful consideration of one of the three most important things for which the workman looks to the management: wages, conditions, opportunity.

Since the present paper is designedly little more than a synopsis of conditions as they are, it would be inappropriate to prolong it into a discussion of the various interesting social and economic aspects of scientific management as related to the wage question as a whole. It must suffice here to emphasize the undoubted fact that scientific management is leading the way both in the actual payment of wages higher than the general market level and in attacking some of the deeper fundamental phases of the problem.

C. *Proper Working Hours*

Mr. Taylor was one of the first to recognize and to prove the fact that overlong working hours are not conducive to high output, and that in very many cases hours of work may be sharply decreased *up to a certain point* and output increased simultaneously,[1] this point having to be scientifically determined for each class of work. The policy of reducing excessive working hours offhand, and of continuing thereafter to reduce them to a point not inconsistent with maximum gross output, has been consistently followed by his associates,[2] and scientifically managed factories as a body today are operating under at least as short hours as any other

[1] For instance, see account of his early work at the Symonds Rolling Machine Company, Shop Management, paragraphs 195–210. The same thing has happened in numerous other cases.

[2] See Thompson, S. E., "Development of Scientific Methods of Management," Trans. A. S. M. E., vol. xxxix, p. 123.

group of plants, while excessive hours on the part of any of them are unknown.

When one stops to consider it, it does seem rather remarkable, not to say significant, that scientific management presents such a uniform history of simultaneous increase in output, increase in quality, increase in wages, decrease in working hours and decrease in costs in those plants where it has been developed. Such is its record, nevertheless, in dozens of applications. It has ceased to be a novelty and is now the expected thing.

D. *Conditions of Work as Related to the Health and Well-Being of the Worker*

Looked at from a perfectly cold-blooded standpoint the return on the investment in the upkeep of the efficiency of the human machine exceeds that on the investment in the upkeep of the mechanical product. A moment's reflection will show why this must be so, for under proper conditions the human mind and heart delivers a *plus* which the inanimate machine is incapable of. From the entirely personal, selfish financial aspect, then, there can be no question that the very best condition for the employee is the very best condition for the owner of the business. And by the word "best" is here meant what is really best for the workman in the long run: wages neither too low nor too high, hours neither too long nor too short, general treatment neither too degrading through neglect or abuse nor too emasculating through ingratiation or paternalism.

From the purely economic standpoint, furthermore, this condition is equally true. It is economically wrong to allow the human machine to work under unsocial conditions of long hours, low wages, poor working conditions, unfair competition and lack of free scope for the

proper exercise of one's individual abilities, because under such unsocial conditions best results are not obtainable from human beings. A prematurely incapacitated workman, much more than an inefficiently employed one, is a direct financial loss to the industry and a direct economic loss to the community.

But it is particularly the social and ethical aspects of the question which I wish to emphasize. That the owners and managers of plants under scientific management recognize and capitalize that source of additional personal profit is true; that they consciously consider their economic obligations may or may not be true; but that they primarily and continuously have the best interests of their people at heart, not from any ulterior motives but because they are that sort of person, I believe can be doubted by no one who will take the trouble to visit them and their employees. They would otherwise never have achieved scientific management — for scientific management is distinctly a thing to be achieved; it cannot be purchased and it cannot be had or maintained without this attitude.

One would naturally expect, therefore, to find in such plants satisfactory conditions as regards accidents, health and sanitation, the speedy and impartial adjustment of grievances, and comfortable working conditions generally. The providing of such necessities follows almost as a matter of course. In addition are found also in varying degrees of completeness rest and recreation rooms, playgrounds, libraries, lunch rooms where necessary operated at cost, first aid hospitals, etc., on an unpretentious scale according to strict utility. Such measures, if initiated upon actual need and if properly regulated, are appreciated by the employees and express the good will of the firm toward them. Then, as a step further, there are the mutual benefit societies and

insurance and retirement funds which were initiated by Mr. Taylor very early in his work and which are very characteristic of plants following his lead as well as of many others at the present time.

There is another phase of this question, however, which is of much greater importance than most of the measures enumerated in that it affects the workman during his entire working hours while he is at the machine and for his entire life as a productive member of society. While it is important to provide means for caring for him during temporary sickness or disability and after he has ceased to be productive, it is at least equally important that his period of usefulness be safeguarded and prolonged through attention to his daily work. This is accomplished through the determination of " the best day's work that a man could do, year in and year out and still thrive under." The object of time study is just this — the determination of a proper day's work which, through allowance for rest and necessary delays, the workman may do year in and year out and thrive under. The setting of a task either too high or too low is equally shortsighted, since the object for which the study is made is thereby defeated. As a vital part of the determination of such a task is the investigation of the tiring effect on a workman for each class of work, investigations commonly described today by the term " fatigue study."

It is significant that the first " fatigue study " ever conducted in a really thoro and scientific manner, so far as the writer's records show, was performed over thirty years ago by Mr. Taylor as a part of his determination of a proper day's work.[1] Indeed, so far ahead of the time was he that, except as embodied in the routine of current time study according to the methods he and his

[1] Taylor, The Principles of Scientific Management, pp. 53–59.

associates developed and insisted upon [1] these early researches seem until very recently to have been generally overlooked until the admirable work of the British Health of Munition Workers Committee served again to emphasize their importance.

And, in closing the discussion of this topic, it may be stated that, in spite of the oft-expressed fears on the part of various estimable gentlemen that the so-called "speeding up" would result to the immediate or ultimate detriment of the worker, no authentic case of anything but beneficial results has been brought to light.

E. *Selection, Fitting, and Training*

It would be difficult to overestimate the advantage both to the individual and to the nation of a condition where each person could be engaged, under conditions satisfactory to him, upon work for which he is naturally best fitted. The misfits in industry are the causes of a direct loss of thousands of dollars annually, and of a loss of initiative impossible to appraise and of far greater importance. In the first place it is an economic waste to hire a workman who is not fitted for the work in hand. This waste is not always avoidable or even to be avoided under all circumstances, however. In the second place, after a man is hired he must be quickly trained to his full productiveness or transferred without delay to work on which this will be possible. He must in the third place, both for his own sake and for that of the management, be taught to do several different operations if possible (see Babcock's formula, item 3, page 491, above), and finally in the fourth place he must be given an opportunity to measure up to his full abilities as he proves, by

[1] See Merrick, D. V., "Time Studies for Delay Allowances," American Machinist, June 21, 1917, p. 1061 (and preceding articles) where carefully worked out charts show proper allowances for rest and delays under various conditions.

and impartial records, that he can assume in-
g responsibilities. It is a direct loss to employ a
n work for which he not fitted, or to fail to take
age to his full ability. The human scrap heap of
aged, discontented and worn out men is but a
eturn for our modern industrial system.

e believe that " for each man some line (of work)
found in which he is first class," it imposes upon
duty of acting in conformity with our belief. In
n it is sound business. Committed from early
o a policy of " scientifically selecting, training,
g, and developing the workman," in plants ad-
to this principle it is the customary thing, there-
o find operatives who are now doing excellent
n their third, fourth, or even fifth trial after hav-
viously been unsuccessful at work for which even
riginally thought they were best fitted. We
lly expect to find, and do actually find, numerous
f promotion from the ranks. Starting with the
l functional foreman inappropriately called the
narian, now developed into the modern func-
ed Employee's Department (known variously
the Personnel Department, the Labor Depart-
the Employment Department, etc.), there is set
only a means for bringing to pass such conditions
e described above, but also a means to establish
aintain a more intimate personal touch between
ement and men, and to modify or counteract the
cies on the part of the foremen and the produc-
ficials generally to press for high production re-
s of the best interests always of the individual,
the part of the employees to go to the other
e. This department is so constituted that it sits
ment over the employee on the one hand and the
ement on the other — acting as buffer, as it were,

between the two. The very recent widespread adoption of this safety valve is a decided step in the right direction and has far-reaching possibilities in capable hands.

F. *Free Scope for Individual Initiative and Opportunity for Advancement*

" Democracy in industry " has been defined as existing where conditions are such as described in the above title. Whether we agree that this is a sufficiently comprehensive viewpoint or not, certainly this degree of " industrial democracy " should constitute the minimum for which we should strive, and is necessary for true progress. And yet even this amount is extremely difficult to obtain in modern industry, even with the best intentions in the world. Opportunity may be abundant, yet there are so many unmeasurable elements to be considered in determining advancement — so many questions of judgment and of personality and of circumstance. The best one may do is to do the best he can, in fair-mindedness and in impartiality.

Monotony, where monotony exists (for there is ample evidence that many for whom in their " deadly monotonous " tasks we are prone to feel compassion, do not at all envy us with our larger responsibilities), is due not so much to the unvarying repetition of recurrent operations as to the accompanying feeling that the work holds no future possibilities. Introduce the possibility and the probability of a more attractive future, and the humdrum task becomes but a stepping stone, seen in its proper relation to the whole scheme of things and eminently serviceable and satisfactory as a present means. The belief that each of us has a marshal's baton in his knapsack is no less stimulating today than it was

in Napoleon's time, and the conviction that we have reached a position of status is no less deadening.

Difficult as it is, therefore, it is nevertheless vitally important that the channels of advancement be kept open and that every incentive and opportunity be given a man for bettering his position. As possibly the most effective avenue through which this is accomplished in scientific management is functional foremanship. The requisites of the customary "line" foreman are so numerous and of such a nature as to preclude from that position all but the rather exceptionally gifted workman. Functional foremanship, by dividing among several foremen the duties ordinarily expected of the one, introduces greater opportunity for the man of limited or specialized talent and at the same time does not lessen the demand for those of greater or more balanced capabilities.

For the most part, since this topic is so closely allied to the preceding one where the provision for definitely teaching and guiding the employees was discussed, little additional emphasis is needed here. Before passing on, however, a prevalent fallacy in regard to the limitations placed on personality in these plants should be noted. The idea is frequently expressed that in working under highly standardized conditions and with detailed instruction and supervision from above in regard to methods, there can be little chance for the exercise for one's individuality.

I believe it has been conclusively demonstrated in practice that scientific management is decidedly a *dynamic* movement, governed not by inflexible methods and case-hardened mechanisms, but solely by *principles*. There have certainly been new developments from time to time sufficient to prove that there is a ready acceptance and adoption of better ways immediately they are

proved. But, and here is the point, they must be *proved*; for it is no less a waste to be constantly upsetting carefully worked out methods upon the insistence of those who, because they have not first mastered present ways, have little right to an opinion at all as to their relative efficiency, than it is to refuse to adopt new and better ways when they are found. We do not and it is right that we should not let a novice tamper with a new and delicate mechanism until he has proved that he has mastered it.

The complaint to this extent, therefore, is well founded. It is not individuality and initiative run wild, however, which is really constructive; it is intelligently applied individuality, and prerequisite to this is an understanding of things as they are and why they are so. Founded on laws based so far as possible on *fact* from whatever competent source obtained, and administered through a democratic form of organization which draws its various functionaries from the ranks of the workman, scientific management embodies "management sharing" on a basis and to a degree infrequently encountered in industry today.

G. *Reduction of Labor Turnover*

It is unnecessary to review either the extent or the evil effects of undue labor turnover. Much has been written on the subject, recent experience has made us familiar with its prevalence, and but brief discussion is necessary here.

Much of the restlessness in industry is curable. It is due to the existence of unsatisfactory conditions in just those features of management discussed in the preceding topics — to low wages, to long hours, to poor working conditions, to lack of proper selection, fitting, and

training, and to a conviction on the part of the employee that for him his present job in his present place offers no future. Naturally, therefore, with the removal of the causes in any particular place the evil itself largely disappears. This has been the experience in numberless plants which have adopted advanced measures more or less completely, and the testimony to this effect is in nowise limited to the particular group of industries we are here considering. The simple fact that their adoption with the accompanying low labor turnover are characteristic of scientific management plants to a high degree, as is proved by their records, is what primarily concerns us at present. Altho the amount of turnover has increased probably without exception during the last three years, it has noticeably been kept within bounds, comparatively, in plants of this type. Upon the introduction of labor-saving devices and methods where increase in sales has been insufficient to enable the retention of the whole previous force, the policy has been adopted of securing an eventual net reduction in personnel, through filling the places of those who voluntarily leave, from the ranks of the resultant force trained, as before mentioned, to perform several different operations.

H. *A Spirit of Coöperation and Confidence, and a Feeling of Security*

As a result of all of the positive products of advanced management enumerated above come the last and most important of them all. Indeed so important is the spirit of coöperation and confidence and the feeling of security on the part of the whole personnel that nothing should be allowed to undermine them; for without them, altho a certain *efficiency* may be obtained, true *scientific management* is impossible.

Coöperation may be obtained only by securing the confidence of those with whom we deal, and this confidence in turn results only when each man feels secure in the belief that he is in the best possible place for him and that he need have no fear for the future as long as he fully plays his own part.

Needless to say a feeling of security is not engendered by rate cutting, by low wages, by long hours and poor working conditions; it does not spring from paternalism nor from leaving in the hands of the foreman — the most directly interested party — the arbitrary power of promotion, reprimand, demotion or discharge with the often resulting nepotism and favoritism, not to say despotism. A sense of security is not furthered through a feeling on the part of the operative that not only is his training, development and guidance neglected by the management, but that even tho he may try hard himself, there is yet little chance for him to secure just recognition. An overemphasis of the profit motive does not lead him to feel that he will not some day be forced to choose between the employer and his own self-respect or his own best interests. Security does not accompany such conditions.

Confidence and an open mind is not established through haphazard methods of manufacture (for which the capable workman at heart has a profound if respectful disgust); low wages and high costs, which he knows are unnecessary, do not impel respect for the management, when he knows they are caused by the nonuse or the misuse of equipment, of labor and of materials which he sees about him and which he knows it is the management's responsibility to remedy. Industrial strife does not inspire in the workman confidence in a management which, as he knows, usually brings it on through shortsighted or selfish dealings. No great

:t for the ability for his leaders is awakened when
ılizes that they know less about what constitutes a
r day's work and how to bring it to pass than he
— when, in other words, the leader knows less in
espect than the led. Only when the management
assumes its full share of the work and the respon-
y may his confidence be secured.

ł only through making this security and this con-
e an actual fact has scientific management been
o produce what it so highly prizes and what it has
narkably obtained — true coöperation.

may thus distinguish several marked character-
and accomplishments of Scientific Management.
rst is its stability — the fact that it has progressed
gh the stages of novelty and exploitation to that of
ınence. The second is its marked contributions to
r economic factors such as increased production
lecreased cost, improvement in quality, a more
capital turnover, and the stimulus to industry in
ıl resulting from the sound foundation of knowl-
ɔn which it is based. The third is its equally strik-
ıt far more important contributions to the field of
n industrial relations in the success with which it
ıaintained industrial peace, increased wages, im-
d working conditions, established proper employ-
and training facilities, stimulated and provided
larger individual opportunity, reduced labor turn-
nd secured true coöperation between management
ıen.

h are some of the notable constructive accomplish-
ı of the science of management in the field of in-
r during the thirty years or less of its development.

HENRY H. FARQUHAR.

ɔNT, MASS.

INDEBTEDNESS OF PRINCIPAL BELLIGERENTS [1]

SUMMARY

Total debts of principal belligerents, 504. — Table showing debts before the war and at its close, 505. — Expenditures, receipts from taxation, and borrowings of the United States, 507. — Great Britain, 508. — France, 510. — Italy, 514. — Russia, 516. — Germany, 519. — Austria-Hungary, 526. — Turkey, 527. — Loans to Turkey from Germany and Austria-Hungary, 529.

THE nine belligerent countries specified in the table below have accumulated, after more than four years of war, debts aggregating 236 billion dollars as compared with a total of 26 billion dollars before the beginning of the conflict. To the grand total, the allied countries contributed 170 billion dollars and the Central Powers, 66 billion dollars. Russia leads all the belligerents in the amount of indebtedness, and its obligations continue to increase daily. Inflation prevails here to a degree that is as astounding as it is deplorable. While in other erstwhile warring countries the issuing of paper money is more or less at a standstill, in Russia the government presses are kept busy night and day printing fresh credit notes. Germany follows next in order of importance, with Great Britain and France closely behind, as seen from the summary on the following page.

It must be remembered, however, that there is considerable duplication in the figures given above, the elimination of which would reduce the aggregate materially. In the amount of the national debt of Great

[1] Because of lack of information, Japan, Belgium and the Balkan belligerents are not discussed in this article.

SUMMARY OF PUBLIC DEBTS OF PRINCIPAL BELLIGERENTS[1]
(Million dollars)

A. *Allied Powers*

Country	Before entering the war		At most recent date		Amount of increase
	Date	Amount	Date	Amount	
Great Britain	Aug. 1, 1914	3,458	Feb. 8, 1919	36,457	32,999
United States	Mar. 31, 1917	1,208[2]	Jan. 31, 1919	23,267	22,059
France	July 31, 1914	6,598	Mar. 31, 1919	30,494	23,896
Italy	June 30, 1914	2,632	Oct. 31, 1918	12,177	9,545
Russia	Jan. 1, 1914	5,092	Jan. 1, 1919	67,362[3]	62,270
Total		18,988		169,757	150,769

B. *Central Powers*

	Date	Amount	Date	Amount	
Germany	Oct. 1, 1913	1,165	Jan. 1, 1919	38,531	37,366
Austria	Aug. 1, 1914	3,277	Oct. 31, 1918	17,072	13,795
Hungary	Aug. 1, 1914	1,989	Oct. 31, 1918	8,707	6,718
Turkey	Mar. 31, 1914	667	Dec. 31, 1918	1,823	1,156
Total		7,098		66,133	59,035
Grand total		26,086		235,890	209,804

Britain there are included loans to Allies and Dominions amounting to £1,683.5 millions on November 12, 1918, or approximately 8,193 million dollars. France had outstanding on March 7, 1918, 3,225 million francs or 622 million dollars, loaned to allied nations. The obligations of the Allies to the United States totaled 7,975 million dollars on January 31, 1919.[4] The extent of

[1] Unless otherwise indicated, the sources of the data presented in this table are identical with those furnished in the text proper. The rates of conversion into dollars are as follows: 1 lira or franc = 19.3 cents; 1 mark = 23.8 cents; 1 pound = $4.8665; 1 ruble = 51.5 cents; 1 Austrian crown = 20.3 cents; 1 Turkish pound = $4.40.

[2] Financial Statement of the United States, March 31, 1917.

[3] Inclusive of 50 billion rubles, conservatively estimated as the amount of paper money put into circulation by the Bolsheviki. Cf. L'Economiste Européen, October 18, 1918, p. 251. A recent statement by the Omsk government placed the circulation at the present time at 70 billion rubles. Cf. New York Times, April 19, 1919.

[4] The credits opened by the United States to its allies (i.e., the amounts not actually expended but upon which the latter can draw) totaled $9,036,269,000 on March 27, 1919.

financial assistance rendered to Bulgaria by Germany and Austria-Hungary is not known, altho it may be safely said that the great bulk of the former's expenditures has been met by loans from the latter two countries. Turkey's indebtedness is largely included in the estimate of its two principal allies for the loans of Austria-Hungary and Germany totaled £T 207 millions by the end of 1917, or 909 million dollars. Consequently great caution must be exercised in the use of figures appertaining to the net debt of belligerent nations.

Another note of warning must be sounded. The total cost of the war to these countries is by no means accurately reflected in the data presented in this table, even after due allowance is made for duplication as specified above. Even were it possible to translate the loss of lives into dollars and to evaluate all the damages and injuries caused by the war, our estimate would fall short of the truth. Increased and new taxation, the burden of which neutrals as well as belligerents had to bear during the war and will be forced to carry for decades to come, is one factor that may be lost sight of upon a superficial study of this table. The inflation resulting from the huge credit operations on government account and the increase in fiduciary circulation, has contributed in no small degree to the war's toll, and to the misery and suffering of the forces behind the firing lines.[1] Finally, one must reckon with the effects of the world war on the public indebtedness of neutral countries. The interruptions in the flow of commerce, seriously reducing the basis for taxation, increased expenditures accompanying mobilization, and observation

[1] In a subsequent article, the writer intends to treat briefly of the fiduciary element in public finance during the war. Some information as to the banking situation at the end of 1917 may be gleaned from an article on which the writer was engaged, appearing in the Federal Reserve Bulletin, April, 1918, pp. 267 et seq.

and maintenance of neutrality guarantees, and the rising costs of conducting the affairs of state have all forced neutral countries to resort to borrowing on a scale that is not usually appreciated.[1]

UNITED STATES

The total disbursements from March 1, 1917, to January 31, 1919, were $26,620,334,804, of which $7,975,267,248 represented loans to foreign governments. During the same period, the receipts, exclusive of the public debt, totaled $6,117,762,295.[2] To this total, receipts from customs duties contributed $357,574,899 and the internal revenue, $5,132,205,822. The ratio of revenue from taxation to total disbursements is therefore 23.0 for the entire period of the war to January 31, 1919, and the ratio of revenue from taxation to net disbursements, excluding loans to foreign governments, is 29.8.

The gross public debt had on January 31, 1919, reached a total of $23,267,039,032, distributed as follows: bonds, Liberty and others, $17,457,365,040; treasury certificates of indebtedness, $4,798,064,800; and war savings certificates, $1,011,609,242. The prewar debt had been reduced to $1,192,444,102 by December 31, 1918.[3]

The results of the four internal loans are indicative of the state of prosperity that existed in this country throughout the period of the war and point to the prodigious financial strength that had lain stored away, only to be mustered up as time and occasion demanded it. The first loan was for $1,989,447,389; the second

[1] A study of the effect of the war on the indebtedness of neutral countries was made by the writer and published in the Federal Reserve Bulletin, May, 1918.

[2] Taken from a statement prepared by Secretary Glass for the House Ways and Means Committee. New York Times, February 12, 1919.

[3] Financial Statement of U. S. Treasury, December 31, 1918.

for $3,807,864,349; the third for $3,793,780,647; and the fourth for $6,989,200,000.[1] In every case the loans were oversubscribed.

GREAT BRITAIN

On August 1, 1914 the public debt stood at £710.5 millions; on February 8, 1919 it had reached £7491.4 millions, representing an increase of £6780.9 millions during the war.[2] In this amount there is, however, included advances to Allies and Dominions which totaled £1683.5 millions on November 12, 1918. The net debt on February 8, 1919 was, therefore, £5807.9 millions.

Details of the gross amount of debt are here given as follows:

(Million pounds)	Aug. 1, 1914	Feb. 8, 1919
Funded debt	586.7	317.7
Terminable annuities	29.6	21.9
Unfunded debt:		
3½ per cent war stock		62.7
4 per cent war stock		16.1
4 per cent and 5 per cent war stock		2012.1
National war bonds		1663.2
Treasury bills	15.5	1009.0
Exchequer bonds	20.5	392.6
War savings certificates		219.6
Other debt		1297.7
American loan		51.4
Temporary advances	1.0	377.2
Total	653.3	7442.2
Other capital liabilities	57.2	49.2
Grand total	710.5	7491.4

For the eight months ending March 31, 1915, the average daily expenditure was £2,050,864; in the fiscal year ending March 31, 1916, £4,271,666; in the fiscal

[1] Financial Statement of U. S. Treasury, December 31, 1918.

[2] London Economist, February 15, 1919, p. 206.

year 1917, £6,022,227; in the fiscal year 1918, £7,386,908 and for the period, April 1, 1918 to December 31, 1918, £7,454,522. At times during 1917, the rise in expenditures was very marked and caused considerable concern when the liberal estimates of the Chancellor of the Exchequer were being continually outdistanced. From April 1, 1917 to May 5, 1917, the daily average was £7,971,000 and from May 6, 1917 to June 9, 1917, it was £7,532,000. A period of recession then set in until expenditures fell to £6,414,000 during the sixty-three days between June 9, 1917 and September 29, 1917. From September 30 to December 1, 1917 a rising tendency was again observable, the average being £6,774,000, and from the latter date to January 19, 1918, the daily expenditures rose to £7,517,000.[1]

For years prior to the outbreak of the war the Treasury showed a surplus of receipts over expenditures. This state of affairs was not maintained during the war but a serious attempt was made to defray a comparatively large proportion of expenses out of revenue. The rates of the income tax were raised in 1915 and again in 1916. Excise and customs duties were increased considerably and a munitions levy was imposed. Finally, in 1916 an excess profits duty was enacted, the fiscal effects of which were not materially felt until 1917.

The first year of the war saw a reduction in the ratio of net receipts from taxation to total expenditures, from 82.6 of the year preceding to 33.9. The following year witnessed a still further decline to 18.7, owing to the enormous increase in expenditures and slow adjustment of revenue. In 1917, the excess profits duty became an important factor in bringing about a rise of 4.8 in the ratio.

[1] Parliamentary Debates, June 25, July 24, December 12, 1917, and January 23, 1918.

The outstanding feature is that from August 1, 1914 to February 8, 1919, Great Britain has defrayed 23.0 per cent of her expenditures by taxation and 26.5 per cent by general revenue receipts (including posts, telegraphs, etc.). Were advances to Allies and Dominions deducted (which are classified as expenditures), it would be found that the ratio of tax receipts to disbursements is 28.1 and the ratio of general revenue to disbursements, 32.4. Details for the last seven years follow:

REVENUES AND EXPENDITURES OF GREAT BRITAIN[1]
(Thousand pounds)

Year ending March 31	Net receipts from taxation	Total revenue receipts of exchequer	Total expenditures	Ratio of net receipts from taxation to total expenditures	Ratio of total revenue receipts of exchequer to total expenditures
1913	154,854	188,802	188,622	82.1	100.1
1914	163,035	198,243	197,493	82.6	100.4
1915	190,054	226,694	560,474	33.9	40.4
1916	290,873	336,767	1,559,158	18.7	21.6
1917	516,276	573,428	2,198,113	23.5	26.1
1918	613,040[2]	707,235	2,696,221	22.7	26.2
April 1, 1918 to Feb. 8, 1919	573,118[2]	654,048	2,268,430	25.3	28.8
August 1, 1914 to Feb. 8, 1919	2,120,010[3]	2,443,236	9,220,282	23.0	26.5

FRANCE

In December, 1917, M. Klotz, Minister of Finance, stated that a deficit of 1,266,500,000 francs was impending in the ordinary budget for 1918, and to meet this exigency, he made five suggestions: (1) a supple-

[1] Compiled from Statesman's Yearbook, 1918; Sixtieth Report of His Majesty's Inland Revenue, 1917; and London Economist, February 15, 1919.

[2] Exchequer receipts from taxation.

[3] Includes eight-twelfths of the 1915 figure. Inasmuch as the fiscal changes during the first eight months of the war were comparatively unimportant, this method of computation was used.

mentary tax on excess profits, the rate to be 25 per cent if the profits remaining after payment of the original tax ranges from one to five million francs, and 50 per cent if the remainder exceeds five millions; (2) upward revision of the tax on inheritances and gifts; (3) new taxes on luxuries and expenditures; (4) revision of the tax on the shares of corporations; and (5) changes in administrative methods with a view of preventing fiscal frauds. These proposals were designed to yield 1,266,500,000 francs as additional revenue for 1918 and 1,774,000,000 francs annually thereafter.[1]

The recommendations of M. Klotz were not, however, followed out in full detail, altho the principle that the impending deficit should not be covered by credit operations was upheld. January 1, 1918 marked the introduction of the new measures as finally decided upon. First, the war profits tax was made applicable to sums of 100,000 francs or less, at the rate of 50 per cent. Progression was provided for when profits subject to the tax exceeded 100,000 francs, the maximum rate being 80 per cent. Second, a tax of 10 per cent *ad valorem* was levied on articles of luxury, and on expenditures in such establishments as hotels, restaurants, etc., which the departmental committee considered *de luxe*, effective April 1, 1918. Third, every payment of a sum exceeding 150 francs representing the retail sale price or the consumption of a commodity became subject to a tax of 20 centimes for every 100 francs or fraction thereof. Fourth, sundry changes were adopted relative to the tax on inheritances and gifts.[2]

The revenue receipts for 1916 were 5,018,343,700 francs; in 1917 they rose to 6,190,533,400 francs; and in

[1] M. Klotz, "Exposé des Motifs," Bulletin de Statistique et de Législation Comparée, December, 1917. The actual results for 1918 were, however, disappointing. The yield of the tax on payments was only 210 million francs as compared with the estimate of 781 millions. Cf. L'Economiste Européen, January 17, 1919, p. 40.

[2] Journal Officiel de la République Française, January 30, 1918.

1918, the total yield was 6,632,639,800 francs, inclusive of the new taxes above mentioned.[1] Revenue for normal years, as computed by the Minister of Finance, produced a total of only 4,159,122,759 francs; therefore, in 1917 the receipts were about one-half larger than those of an average year and about three-fifths larger in 1918.

Remarkable as this attempt may seem when it is recalled that during the last five months of 1914 the treasury receipts declined 38.6 per cent as compared with a normal year; in 1915, 19 per cent; and in 1916, 3.46 per cent,[2] the state of the French finances is by no means satisfactory. M. Ribot recently stated that the civil budget for 1919 involved an expenditure of 8.9 billion francs, exclusive of 1.1 billion francs for interest on the new loan (fourth), plus payments for damages, advances, etc., which will bring the total to about 17 billion francs.[3] With no new lucrative sources of revenue in sight and open dissatisfaction expressed with the luxury and income taxes, the situation is considered by some as being but short of alarming.

M. Klotz stated that in 1914, the average monthly expenditure was 1,318 million francs; in 1915, 1,900 million francs; in 1916, 2,743 million francs; and during the first nine months of 1917, 3,360 million francs—a total of 92,546 million francs for the whole period. During the same interval the total receipts were 13,816 million francs, or 14.9 per cent of the expenditures. In the revenue figures, however, there are included the income from monopolies and domains, and if the latter is ex-

[1] Taken from various numbers of the Journel Officiel de la République Française, and L'Economiste Européen, January 17, 1919, p. 40 (figures for 1918 incomplete).

[2] "Exposé des Motifs," op. cit.

[3] London Economist, December 28, 1918. Recently M. Klotz announced the total of the 1920 budget as 18.5 billion francs as compared with 5.3 billion francs for a normal year. Ibid., February 22, 1919, pp. 327, 328.

cluded, the ratio of taxes to expenditure is approximately 12 per cent for the first 38 months of the war.

In a more recent statement before the Chamber of Deputies, M. Klotz asserted that from August 1, 1914 to March 31, 1919, the expenditures for all purposes will have reached 192 billion francs, including 50 billion francs of exceptional expenses such as payments for war damages, pensions, etc.[1] The resources to that date were estimated at 158 billion francs, leaving a deficit of 34 billion francs. Of the resources only 18 billion francs represent the receipts from taxation. The ratio of receipts from taxation to total expenditures from the beginning of the war to March 31, 1919 is, therefore, only 9.4.

The results of the four internal loans are as follows:[2]

Year	Rate of interest	Price of issue	Nominal subscriptions (million francs)	Actual proceeds (million francs)
1915	5	87.25	15,205	13,308
1916	5	87.50	11,514	10,082
1917	4	68.60	14,803	10,171
1918	4	70.80	27,853	19,720
		Total	69,375	53,281

On July 1, 1914, the national debt of France was 34,188,147,969 francs, and the annual interest charges, 1,037,614,906 francs. On December 31, 1917, the former stood at 124,338,457,479 francs, and the latter at 5,216,617,058 francs. Of the total outstanding December 31, 1917, 20,441,545,000 francs were held outside of France and 44,822,153,800 francs, or approximately one-third of the total debt, had not been funded as yet.[3]

[1] London Economist, February 22, 1919, pp. 327–328.

[2] Ibid., December 7, 1918. A fifth loan, called "Loan of National Restoration," to be issued at 95 and bearing interest at 5 per cent was announced in the Journal Officiel, March 23, 1919. The amount of the loan has not been fixed as yet. Cf. also Le Monde Economique, December 7, 1918, p. 779.

[3] Bulletin de Statistique et de Législation Comparée, October, 1918, p. 602.

On August 31, 1918, the national debt of France was estimated (unofficially) at 130,127 million francs, consisting of the following: consolidated debt, 32,187; national defense treasury bills, 26,453; short-term bonds, 679; advances of the Bank of France and the Bank of Algiers, 19,415; credits of foreign countries, 25,678; pre-war debt, 25,715.[1] If to this sum there is added the fourth loan of 27,853 million francs, the debt at the end of 1918 may be placed at 157,710 million francs.[2]

ITALY

The official estimate of war expenditures from August 1, 1914 to October 31, 1918, is as follows:[3]

	Million lire
Aug. 1, 1914 to June 30, 1915	3,039.2
Fiscal year ending June 30, 1916	8,351.5
Fiscal year ending June 30, 1917	14,132.2
Fiscal year ending June 30, 1918	19,734.6
July 1, 1918 to Oct. 31, 1918	9,725.6
Total	51,983.1
Various deductions	984.6
Balance	50,988.5
Add payments to be made in foreign countries and interest paid upon war debts by Treasury	11,620.5
Total payments relating to war	62,619.0
Deduct military expenditures which would have been incurred, had peace prevailed	3,545.7
Net war expenditure	59,073.3

[1] L'Economiste Européen, October 4, 1918, pp. 212–213, Edmond Théry.

[2] M. Ribot estimated it at 170 billion francs. London Economist, December 28, 1918. The estimate in the text coincides roughly with the figures presented by M. Klotz as of March 31, 1919.

[3] Ibid., February 1, 1919, pp. 135–136.

The public debt stood at 63,093 million lire on October 31, 1918, composed of the following: [1]

Old debt		13,636
War debt:		
First loan, 4½ per cent, issued July, 1915, redeemable between 1925 and 1940 Second loan, 5 per cent, issued Jan.–March, 1916, redeemable between 1925 and 1940 Third loan, 5 per cent, issued Feb., 1917, not redeemable before 1931	4,628	
Fourth war loan, 5 per cent, issued Feb., 1918.	3,986	
Fifth war loan	6,123	
Total internal loans	14,737	
Treasury bonds, 5 per cent (3 to 5 years)	3,052	
Exchequer bills, from 3 to 12 months	9,240	
Treasury bonds, discounted by British and American governments and credits opened by same	13,851	
Notes, issued by banks of issue for government account	6,536	
Notes, issued by government	2,041	
Total war debt		49,457
Grand total, Oct. 31, 1918		63,093

M. Nitti, Minister of Finance, recently stated that the actual deficit for the financial year 1917–18 was 6,271 million lire. Expenditures totaled 25,239 million lire of which 18,580 were for war purposes. Against this amount there were revenue receipts, 7,496 million lire, and proceeds from loans, 11,529 millions.[2] The budget for 1918–19 provided for receipts at 4,419 millions and ordinary expenditures at 4,207 millions,[3] as against

[1] Bankverein Suisse, February, 1917; Statesman's Yearbook, 1917; and London Economist, December 28, 1918.

[2] L'Economiste Européen, December 6, 1918, p. 363; Revue Financière et Economique d'Italie, October 31, 1918, p. 276.

[3] Bulletin de Statistique et de Législation Comparée, February, 1918, "Exposé Financier de M. Francesco Nitti, Ministre du Trésor, December 19, 1917," pp. 265–321.

4,855 millions and 5,515 millions, respectively, in the 1919–20 budget.[1]

A war profits tax, retroactive in character to the beginning of the war, was recently introduced.[2] New or accrued profits in excess of the ordinary amount subject to the income tax during the two years, 1913 and 1914, comprise the base of the war profits tax. All recipients are divided into two classes: Class A, persons engaged in industrial, commercial and mercantile pursuits, and Class B, middlemen (Fr. *intermédiaires*). For Class A, the rates vary from 12 per cent of the profits above 8 per cent to 10 per cent of the capital, to 35 per cent on profits exceeding 20 per cent of the capital employed, during the period August 31, 1914 to December 31, 1915. For the periods subsequent to December 31, 1915 the minimum rate is 20 per cent and the maximum 60 per cent. Those falling in Class B are taxed during the earlier period at the rate of 5 per cent on profits ranging from one-tenth to one-half of the basic figure, up to 35 per cent if the profits are triple the amount ordinarily accumulated. The minimum and maximum rates for periods subsequent to December 31, 1915, are 10 per cent and 40 per cent, respectively.

Russia

The discussion of the fiscal situation of Russia falls into two periods: (1) from the beginning of the war to October 14/27, 1917, when the Kerensky régime was overthrown; and (2) the period following the Bolshevist *coup d'état*.

From August 1, 1914 to the end of the year, the expenditures amounted to 2,546 million rubles; in 1915, they were 9,374.9 millions; 1916, 15,267 millions; and

[1] London Economist, December 21, 1918.

[2] Bulletin de Statistique et de Législation Comparée, May 1918, pp. 958, 959.

from January 1, 1917 to September 1, 1917, 14,204.8 millions; making a grand total of 42,392.7 million rubles. In October, 1917, the Minister of Finance stated that the total cost of the war would reach 51,470 million rubles by January 1, 1918.[1]

The growth of the national debt accompanying these tremendous outlays may be observed as follows:[2]

	Rubles
January 1, 1914	9,888,309,698
January 1, 1915	10,473,572,000
January 1, 1916	18,876,731,000
January 1, 1917	25,220,937,000
September 1, 1917	49,287,809,698

In the eight months of 1917 preceding the collapse of the Kerensky government, the public debt practically doubled, the total consisting of foreign loans, 8,461 million rubles; short-term obligations, 16,918.7 millions; internal loans, 11,408.2 millions; deficits incurred during the last three budget years, 2,611.6; and the pre-war debt of 9,888 millions.

Advances of the Bank of Russia to the Russian government played an important rôle in financing the war. On December 16/29, 1914, they totaled 1,016.9 million rubles; on December 16/29, 1915, 5,304.6 millions; on the same date of the following year, 8,591.2 millions and on October 16/29, 1917, they reached 18,362.2 million rubles.[3] During the same interval the notes in circulation rose from 2,864 million to 16,519 million rubles.

The internal war loans yielding 11,408.2 million rubles were made up as follows:[4]

[1] Viestnik Finansov, No. 39, October 14, 1917, pp. 369 et seq.

[2] Ibid.

[3] From the weekly statements of the Imperial Bank of Russia and the weekly reports contained in the London Economist.

[4] Taken from Statesman's Yearbook, 1917, Introduction (£ converted into rubles at 9.45685); also Le Rentier, October 17, 1917; and L'Economiste Européen, December 14, 1917, p. 380.

	Million rubles
State loan of 1914, 5 per cent, issued Oct., 1914, at 94	500
First loan of 1915, 5 per cent, issued Feb., 1915, at 94.	500
Second loan of 1915, 5½ per cent, issued April, 1915, at 99. .	1,000
Short-term loan of 1915, 5½ per cent, issued Oct., 1915, at 95	1,000
First loan of 1916, 5½ per cent, issued Feb., 1916, at 95. ...	2,000
Second loan of 1916, 5½ per cent, issued Oct., 1916, at 95...	3,000
Total, to end of 1916.....	8,000
Liberty loan of 1917, 5 per cent (computed)[1]	3,408
Grand total.....	11,408

The finances during the second period when the Bolsheviki assumed control can at best be inadequately described. Little reliable data are available, upon which conclusions may be based. The official Bolshevist organ, *Isvestia*, places the national debt on January 1/14, 1918, at 80,800 million rubles, composed as follows:[2] external loans, 15,800 million rubles; direct internal debt (of every description and character), 44,000; indirect interior debt, 4,800; "coupons" not presented and miscellaneous obligations, 15,200 millions.

A tax on capital, similar to the German "Kapitalsteuer" and designed to yield 10 billion rubles, was levied on the "bourgeoisie" during the latter part of 1918. In some provinces the yield was only one ten-thousandth of the estimate, and the results in general were so disappointing that it was considered "hardly worth entering in the budget as a separate item."[3] Likewise the tax in kind on richer peasants which was supposed to produce 7 billion rubles in foodstuffs has proved to be negligible in its results. The taxation authorities in the provinces of Orel, Kaluga and Tula reported that they were unable to collect the tax.[3]

[1] Represents the difference between the aggregate internal loans as stated by the Minister of Finance and the total of the preceding items.

[2] L'Economiste Européen, May 10, 1918, p. 299.

[3] London Economist, March 1, 1919, pp. 367, 368; Journal des Economistes, February 15, 1919, article by A. Raffalovich, "Finances bolcheviques en 1918," pp. 249-252.

Further light is shed on Bolshevist fiscal policies by the following summary representing budgetary estimates for 1918 and giving final results for 1917 (in thousand rubles):[1]

	Year 1917	First half 1918	Second half 1918
Expenditures:			
Ordinary	13,196,137	13,038,511	26,276,199
Extraordinary	14,675,131	4,564,216	2,797,995
Total	27,871,268	17,602,727	29,074,194
Revenues	.....	2,852,727	12,730,194
Deficit	.....	14,750,000	16,344,000

The fall in values consequent upon tremendously large issues of paper money reflects itself in the government budget of expenditures. This fact coupled with the new social policy on which the government is embarking, involving a prodigious outlay, explains the wide disparity between receipts and expenditures. Whereas the figures presented above by M. Krestinsky, Minister of Finance, are more or less true estimates as to the outgo, the income has been in all probability greatly overestimated. Witness the fact that the actual revenue for the first half of 1918 was only 539.6 million rubles, altho undue optimism produced an estimate of 2,852.7 million rubles, or nearly five times as much as was actually collected! Credit notes are issued to wipe out the deficit.

GERMANY

The financial policy of Germany stands in distinct contrast to that adopted by the allied countries. The outstanding feature of German war finance is the reliance placed on loans and advances to defray the

[1] London Economist, January 25, 1919, pp. 103, 104.

prodigious expenses incurred since the beginning of the war. The theory that a reasonable share of war expenditures should be met by increased taxation had found no strong adherents in the statesmen and financiers of Germany until recently, and consequently not only have expenses directly incidental to war not been covered by revenue at all but even debt charges and other items of the ordinary civil budget have been met from the proceeds of loans.

There are two reasons of weight that have in all probability operated to keep this policy strongly intrenched. First, the lack of elasticity in sources of revenue has been an almost insurmountable obstacle to the imperial government. According to an understanding reached by the Empire and the individual states, the former reserved for itself primarily the field of indirect taxation and permitted the individual states to exploit the remaining sources. With the outbreak of the war, imperial revenues declined because commerce with Germany was interrupted, and import duties and stamp taxes which constituted important items in the budget fell off considerably. Gradually this condition became more and more accentuated until it was decided to raise the rates of the tax on beer, tobacco, etc., to cover part of the ever-increasing deficit in the ordinary budget. This relief was, however, ephemeral in nature, since the expansion of military operations and the inflation process set in motion by heavy borrowings caused expenditures to soar to prodigious heights, beyond all reasonable calculation.

Meanwhile, the war also imposed additional burdens on the individual state governments and their war obligations became heavy. Existing sources of revenue were used to aid in meeting these expenses. Prussia, for example, increased the rates of the income tax, ranging

from 115 to 260 per cent of normal in respect to corporations and from 108 to 200 per cent of normal in respect to individuals, and the supplementary tax was increased by 50 per cent.[1] Bavaria and Württemberg advanced the rates of all direct taxes by 30 per cent; Saxony, from 10 to 30 per cent in the case of the income tax, and Baden, 25 per cent in some grades. Hesse increased the income tax rates by 27 per cent and the property tax rates by 82 per cent.[2]

Late in 1916, however, the imperial government found no alternative but to invade the territory heretofore reserved for the states, if it wished to maintain some semblance of meeting its interest charges out of current revenue. A direct tax was introduced, designed to reach the increment in the value of property of every description, in the years 1915 and 1916, and estimated to yield 1300 million marks. Tobacco duties and postal and telegraph rates were increased and new stamp duties were put into force. The total yield was estimated at 1950 million marks. Again, in 1917, some of the existing stamp taxes were advanced further and a coal tax of 20 per cent *ad valorem* (10 per cent for domestic consumers) was levied, effective until July 31, 1920. The property tax rates were also increased by 20 per cent and the total receipts from the new taxes were estimated at 1250 million marks, making a total of 2550 million marks of war taxation during the year.

In spite of the large income anticipated from the new taxes, a deficit of 86 million marks was foreseen in the

[1] Prussia which had no debt to speak of prior to the war, due to the large profits obtained from the operation of government-owned railroads, had accumulated a debt of approximately $1,450,000,000 by the end of March, 1919. The total war deficit to that date was $582,000,000. New York Times, April 8, 1919.

[2] F. W. Zimmerman, Bank Archiv, August, 1917. The "defence" levy imposed in 1913 was not collected until early in the war. It amounted to 966,845,100 marks or 14.89 marks per capita, to which Prussia alone contributed 593,719,400 marks or about 61 per cent. Cf. London Economist, July 27, 1918, p. 111.

SUBSCRIPTIONS TO GERMAN WAR LOANS[1, 2]

(Amounts in million marks)

Subscriptions	First Loan (Sept. 10–19, 1914)				Second Loan (Feb.[1]27–Mar. 15, 1915)				Third Loan (Sept. 4–22, 1915)				Fourth Loan Mar. 4–22, 1916)			
	No. of sub.	%	Amt.	%	No. of sub.	%	Amt.	%	No. of sub.	%	Amt.	%	No. of sub.	%	Amt.	%
1. Up to 200 marks	231,112	18.2	36	0.9	452,113	16.8	71	0.8	984,358	24.8	130	1.1	2,406,118	45.5	201	1.9
2. 300 to 500.	241,804	19.1	111	2.5	581,470	21.6	254	2.8	858,259	21.6	369	3.1	967,929	18.2	407	3.8
3. 600 to 1,000	543,143	42.9	587	13.1	660,776	24.5	604	6.7	918,595	23.2	844	7.0	885,941	16.7	794	7.4
4. 1,100 to 2,000					418,861	15.6	733	8.1	530,176	13.4	928	7.7	468,724	8.9	792	7.4
5. 2,100 to 5,000	157,591	12.4	579	13.0	361,459	13.4	1354	14.9	422,626	10.7	1563	12.9	347,725	6.6	1247	11.6
6. 5,100 to 10,000	56,438	4.5	450	10.1	130,903	4.9	1057	11.7	147,593	3.7	1202	9.9	113,927	2.2	907	8.5
7. 10,100 to 20,000	19,913	1.6	307	6.7	46,105	1.7	745	8.2	53,445	1.3	858	7.1	42,158	1.0	666	6.2
8. 20,100 to 50,000	11,584	0.9	410	9.2	26,407	1.0	926	10.2	32,840	0.8	1167	9.6	30,361	0.6	980	9.1
9. 50,100 to 100,000	3,629	0.3	315	7.2	7,742	0.3	648	7.2	10,090	0.3	850	7.0	9,100	0.2	734	6.9
10. 100,100 to 500,000 ...	2,050	0.1	509	11.4	4,361	0.2	1066	11.7	7,074	0.2	1766	14.6	6,308	0.1	1531	14.3
11. 500,100 to 1,000,000..	361	..	287	6.4	538	..	440	4.9	832	..	695	5.7	780	..	641	6.0
12. Over 1,000,000.....	210	..	869	19.5	325	..	1162	12.8	530	..	1729	14.3	574	..	1812	16.9
Total.....	1,267,235	100.0	4460	100.0	2,691,060	100.0	9060	100.0	3,966,418	100.0	12,101	100.0	5,279,645	100.0	10,712	100.0
Final results, including subscriptions from abroad and battle field	....	..	4480	..	....	..	9106	..	....	..	12,162	..	....	..	10,767	..
Details:	Issued at 97½ in two forms: (a) 5 per cent treasury bills falling due Oct. 1, 1920; and (b) 5 per cent bonds, not redeemable before [illegible]				Issued at 98½ in same two forms as the first loan.				Issued at 99 in the form of bonds, redeemable Oct. 1, 1924.				In two forms, viz.: (a) 4½ per cent treasury bills at 98 due July 1, 1923; and (b) 5 per cent loan at 98½, redeemable after Oct. [illegible]			

1. Up to 300 marks	1,794,084	47.1	154	1.4					3,233,472	61.9	208	1.6
2. 300 to 500	681,027	17.9	293	2.8	6,204,800	91.7	2226	17.15	693,729	13.2	295	2.4
3. 600 to 1,000	605,594	15.9	552	5.2					586,623	11.6	531	4.3
4. 1,100 to 2,000	301,863	7.9	520	4.9					264,871	5.1	461	3.7
5. 2,100 to 5,000	245,873	6.5	911	8.5					233,542	4.5	868	7.0
6. 5,100 to 10,000	93,189	2.4	763	7.2	443,200	6.5	2158	16.62	100,781	1.9	818	6.6
7. 10,100 to 20,000	40,571	1.1	651	6.1					42,732	0.8	697	5.6
8. 20,100 to 50,000	28,500	0.7	982	9.2	92,000	1.4	2110	16.25	33,914	0.6	1189	9.5
9. 50,100 to 100,000	9,748	0.3	810	7.6	19,500	0.3	1062	8.18	12,169	0.2	1024	8.2
10. 100,100 to 500,000	7,870	0.2	1710	16.1					9,145	0.2	2092	16.8
11. 500,100 to 1,000,000	1,032	..	853	8.0	11,200	0.1	5420	41.8	1,363	..	1130	9.1
12. Over 1,000,000	725	..	2448	23.0					1,032	..	3145	25.2
Total	3,809,976	100.0	10647	100.0	6,768,082	100.0	12979	100.0	5,213,373	100.0	12458	100.0
Final results including subscriptions from abroad and battle-field	....	..	10699	..	....	..	12979	..	....	..	12626	..
Details:	In two forms, viz.: (a) 4½ per cent treasury bills at 95, due between 1923 and 1932; and (b) 5 per cent loan at 98, not redeemable before Oct. 1, 1924.				In two forms, both at 98: (a) 4½ per cent bond, redeemable in drawings at 110 to 120; and (b) 5 per cent bonds, not redeemable before Oct. 1, 1924.				Details same as sixth loan.			

[1] Sources: Reports of the Reichsbank, 1915 and 1916; Berliner Tageblatt, December 23, 1917; Frankfurter Zeitung, September 6, 1917; and London Economist, May 19, 1917.

[2] Full details not available in this country, as far as can be ascertained. Approximate figures as herein given are taken from Revue d'Economie Politique, Janvier-Février, 1918, article by Charles Rist, p. 39. The total is the one officially announced.

[3] In addition to the seven war loans shown in this table, two further loans were issued, the full details of which have not been made public. The subscriptions to the 8th loan amounted to 14,500,000,000 m. (according to L'Economiste Européen, April, 26, 1918, p. 270) and the 9th loan, 10,433,959,700 m. (London Economist, December 14, 1918). The number of subscribers to the last loan was 2,717,657, of whom 2,297,143 subscribed for 1000 marks or less (ibid.). Savings banks contributed 3,302 million marks and other banks and bankers, 5,349 millions (L'Economiste Européen, December 13, 1918).

civil budget for the fiscal year 1918. The sphere of taxation, altho expanded on these occasions, was necessarily too restricted for the needs of the imperial government.[1]

The second reason for the delay in setting up a sound policy of war financing was that from the beginning of the conflict up to the time that a change in the fortunes of war took place, German statesmen entertained the hope of speedily gaining a decisive victory over their adversaries, crushing one or more of them completely and exacting heavy indemnities. German militarists considered it highly probable that they could force their vanquished enemies to bear the burdens of war and consequently hesitancy was displayed on the part of the imperial government in revising its financial policies. This illusion was gradually dispelled by the turn of events and facing the alternative of incurring heavier and heavier deficits, the only expedient of increasing the revenue from taxation was followed. The tide was not, however, stemmed to any large degree.

The results of the first seven war loans are here given. While the boast of German officialdom that war loans had become increasingly popular may be justified by a glance at the number of subscribers in each class, a study of the amounts subscribed seems clearly to indicate that the contrary is true. The ratio which subscriptions of a million marks or more bore to the total was 19.5 in the case of the first loan, dropping to 12.8 in the second and rising thereafter until in the seventh loan it amounted to 25.2. In every case, the number of these

[1] For the fiscal year 1919, the rates of the imperial income tax as proposed vary from 5 per cent on the first 10,000 marks to 50 per cent on the excess above 200,000 marks and the rates of the war tax on property, from 1 per cent on the first 200,000 marks to 5 per cent on a million marks and above. L'Economiste Européen, July 12, 1918, p. 29.

ıbscriptions was practically negligible. Subscriptions 100,000–500,000 marks rose from 37.3 per cent in the st loan to 51.1 per cent in the seventh loan, while at ıe same time the amount of subscriptions of 2000 marks less, comprising 91.8 per cent of the total number of ıbscribers in the last loan, fell from 16.5 per cent in the st to 12.0 per cent in the seventh war loan. The first ven classes all show declines, altho the decreases are ıither alike nor continuous in every instance. The eatest per cent of increase in the amounts subscribed exhibited by the last class, embracing subscriptions a million marks or more, and following closely are ıbscriptions between 100,000 and 500,000 marks. All ese facts point to the conclusion, therefore, that eater and greater reliance was being placed upon ınking credit and that popular subscriptions, altho creasing in number, were contributing progressively ss and less to the total.

The sum of 139 billion marks was voted by the eichstag up to July, 1918. In October, 1918, the vernment stood in need of more funds and requested billion more. This amount was refused and the govnment resorted to note issues as a result.

According to a speech recently made by Dr. Schiffer,[1] stwhile Minister of Finance, the daily expenditure ring the war rose from 49 millions in 1914 to 135 milns in 1918. The yearly expenditures were as follows billions of marks): 1914, 7.5; 1915, 23; 1916, 26.6; 17, 39.5; 1918, 48.5. In addition credits were opened Germany to her allies to the extent of 9.5 billions, d treasury bonds were issued to the extent of 6 bilns, making a total war expenditure of 160.6 billion rks. If to this amount, there is added the pre-war

[1] New York Times, February 18, 1919.

debt, as of October 1, 1913, 4,897 million marks,[1] the present indebtedness of the German Empire may be put roughly at 165 billion marks.[2]

AUSTRIA-HUNGARY[3]

The expenditures of Austria alone for civil and war purposes were 10,706 million crowns in the fiscal year ending June 30, 1915; 15,726 millions in 1916; 18,788 millions in 1917; and 22,170 millions and 24,321 millions, as estimated in the 1918 and 1919 budgets, respectively.[4] The declaration of the armistice and consequent demobilization will in all probability greatly reduce the latter figure.

The Budgetary Committee of the Reichsrat estimated for the year 1917 the ordinary revenue to produce 3,890 million crowns and extraordinary taxation 304 millions, a total of 4,194 millions or 18.9 per cent of the expenditures.[5] In the 1919 estimates the revenue is placed at 4,885 million crowns or 20.1 per cent of the disbursements. These deficits are covered partly by advances from the Austro-Hungarian Bank and partly by inter-

[1] Statistisches Jahrbuch für das deutsche Reich, 1915, p. 359. This figure may be taken as indicating the maximum state of the debt during the period, October 1, 1913, and the beginning of the war, since the tendency had been to reduce the amount outstanding during the few years prior to October 1, 1913.

[2] This estimate coincides roughly with that of Sir Edward Holden, London Economist, February 1, 1919, pp. 142 et seq. Under date of March 27, 1919, the New York Times published a statement made by Dr. Schiffer at Weimar to the effect that total war expenditures to the end of 1918 were 186 billion marks, and revenues 17 billion marks or 9.1 per cent of the former. The war debt was placed at 157 billion marks and the interest on the debt, at 7.9 billion marks. Annual expenditures for the future were estimated at 14 billion marks as against 2.4 billion marks before the war.

[3] German Austria has recently adopted a budget for the period November 1, 1918 to June 30, 1919. A loan of 500 million crowns was issued, consisting of 4 per cent treasury bonds payable within two and one-half years. The issue price was 97 if payment was made in specie, and 99, if one-fourth of the amount subscribed for was paid in Austrian war bonds and the remainder in specie. Cf. L'Economiste Européen, December 13, 1918, p. 383.

[4] L'Economiste Français, January 12, 1918, p. 36.

[5] Neue Freie Presse, September 26, 1917.

nal loans. Practically every source of revenue has been tapped to the maximum limit.

Expenditures for purely military purposes totaled 38,636 million crowns for the first four years of the war, of which 6,327 millions were made in 1915; 9,513 in 1916; 11,453 in 1917; and 11,343 millions in 1918.[1]

The war debt of Austria on May 24, 1918 was 57,052 million crowns, as given by the Reporter on the National Debt to the Austrian Budget Commission.[2] Of this amount 16,209 represented advances of the Austro-Hungarian Bank; 29,275, proceeds of internal loans (less conversions); 16,209, advances of Austrian banks; and 3,234, advances of German banks. On October 31, 1918, the total public debt of Austria was 84,097 million crowns, according to the Annual Report of the Austro-Hungarian Bank, of which 67,955 represented the amount resulting from the war.[3]

The total debt of Hungary stood at 42,891 million crowns on October 31, 1918, of which 33,091 millions were incurred during the war.[4] Approximately 16 billion crowns represent the net proceeds from loans, about 10 billions are due the Austro-Hungarian Bank and the remainder of the war debt consists of advances by private banks.[5]

Turkey

In normal years the national revenues varied from 25 to 30 million Turkish pounds but in 1916, owing to the continual decrease in import and export duties through the interruption of commerce receipts fell to 21 millions. The budget for 1918–19, estimated revenue at

[1] L'Economiste Européen, August 2, 1918, p. 77.

[2] Ibid., June 7, 1918, p. 366 and London Economist, June 29, 1918, p. 1082.

[3] L'Economiste Européen, January 31, 1919, p. 78.

[4] Ibid.

[5] London Economist, December 28, 1918, p. 882.

WAR LOANS OF AUSTRIA-HUNGARY[1]

(Amounts in million crowns)

	Austria		Hungary	
First Loan	2,201	Issued Nov., 1914 at 97½, 5½ per cent, matures April 1, 1920 at par.	1,175	6 per cent loan issued Nov., 1914 at 97½, not redeemable before Nov. 1, 1920.
Second Loan	2,688	Issued May, 1915 at 95¼, 5½ per cent, not redeemable before 1925.	1,132	6 per cent stock, issued May, 1915 at 97.5, not redeemable before 1921. 5½ per cent stock at 90.8, not redeemable before 1925.
Third Loan	4,203	Issued Oct., 1915 at 93.6, 5½ per cent treasury bills, not redeemable before Oct. 1, 1930.	1,985	Issued Oct.–Nov., 1915 at 97.1. 6 per cent Rente not redeemable before 1921.
Fourth Loan	4,520	Issued May, 1916 in two forms: (a) 5½ per cent treasury bills repayable at par, June, 1923 at 93. (b) 5½ per cent bonds to run for 40 years, at 95.5.	2,025	Issued April–May, 1916. 6 per cent Rente at 96.7, not redeemable before Nov. 1, 1921. 5½ per cent treasury bills at 91.4, not redeemable before June 1, 1926.
Fifth Loan	4,467	Issued Nov., 1916–Jan., 1917, in same form as preceding loan. Issue price 92½ and 96½, respectively.	2,415	Issued Nov.–Dec., 1916. 6 per cent Rente at 97.2, not redeemable before 1920. 5½ per cent treasury bills at 95.5, redeemable at 105 between 1922 and 1942.
Sixth Loan	5,189[2]	Issued May–June, 1917, in same form as preceding loan. Issue price 92½ and 94, respectively.	2,500[2]	6 per cent Rente and 5½ per cent treasury bills.
Seventh Loan	6,044[2]	Issued Dec., 1917, in two forms: (a) 5½ per cent loans at 91, redeemable at par by drawings between 1923 and 1957. (b) 5½ per cent bonds at 93, redeemable at par, 1926.	3,690[2]	Issued Dec., 1917. 6 per cent Rente at 96.1. 5½ per cent treasury bills at 91½, convertible at option of government after Aug. 1, 1922.
Eighth Loan	5,763[2]	(a) 5½ per cent treasury bonds at 95½ due Sept. 1, 1924.[4] (b) 5½ per cent Rente amortizable in 40 years at 94.[4]	3,860[2]	Issued June, 1918. 5½ per cent Rente at 91 and 92, according to cash payment or installment. No date set as to redemption.
Total.....	35,075		18,782	

[1] General sources: Statesman's Yearbook, 1917; Fremden-Blatt, December 16, 1917; Frankfurter Zeitung, October 24, 1917; Kölnische Zeitung,

£T 37,016,698 and expenditure at £T 51,402,327, thus leaving a deficit of £T 14,385,629 to be met by credit operations.[1] The budgetary deficits for the fiscal years 1917 and 1918 were £T 39,077,556 and £T 27,430,396, respectively.[2] Actual war expenditures have averaged about five million Turkish pounds monthly, the total being £T 180,000,000 by the end of 1917.

The subscriptions to the first Turkish internal loan disclosed a total of £T 17,977,600, of which £T 7,396,260 were raised in Constantinople and the remainder, in the provinces. This was the first and only attempt on the part of the Ottoman government to defray military expenses out of funds derived from native sources.[3]

The Ottoman debt may be estimated at £T 414,334,000, consisting of the following items:[4]

Loans from Germany, to Aug. 31, 1917.....	£T 142,000,000
Loans from Austria-Hungary.....	8,200,000
Requisitions and deferred payments.....	38,000,000
Borrowed from Germany in October, 1917..	56,500,000
First internal loan.....	17,978,000
Total war debt.....	£T 262,678,000
Pre-war debt.....	151,656,000
Total public debt.....	£T 414,334,000

The details of the first six issues of Turkish notes in Germany may be gleaned from articles in the *Frankfurter Zeitung*.[5] The first issue of £T 5,661,000 payable six months after peace is declared, is secured against a deposit of £T 3,552,000 in gold held in Germany and

[1] London Economist, February 23, 1918.
[2] Statesman's Yearbook, 1917, p. 1352.
[3] London Economist, September 7, 1918, p. 300.
[4] Nieuwe Rotterdamsche Courant, December 5, 1917 and Statesman's Yearbook, 1917. This estimate excludes a loan rumored to have been made shortly before the capitulation of Germany and reported as varying from 32 to 45 million Turkish pounds. London Economist, September 7, 1918, p. 300. On the bulk of these loans, floated outside of Turkey proper, there are no interest charges to be met.
[5] October 12 and 15, 1917, in particular.

£T 2,109,000 held in Austria. The second issue of £T 7,802,000 and the third issue of £T 11,700,000 are both payable one year after peace, being covered by German exchequer bonds. The fourth loan of £T 27,777,940, repayable in gold from three to seven years after the declaration of peace, was issued against German exchequer bonds and is payable from eight to eleven years after peace. The German government at the same time guaranteed that the Turkish pound would never be allowed to fall below 18.45 marks.

Although the law of April 8, 1916, placed the currency on a gold basis, Turkey is now almost completely on a paper basis. The currency is greatly depreciated. Information from German sources had, early in 1917, placed the discount on paper money between 50 and 75 per cent in Constantinople and between 75 and 80 per cent in Bagdad and Syria.[1] It is also reported that the Cabinet has recently decided on the decimal system of coinage and metric system of weights and measures.[2]

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[1] Article by Dr. C. A. Schaefer in Archiv für Wirtschaftsforschung in Orient, April, 1917.

[2] London Economist, September 7, 1918, p. 300.

THE IRON-ORE PROBLEM OF LORRAINE

SUMMARY

Importance of iron-ore reserves of Lorraine, 531. — Comparison with reserves of other countries, 534. — Quality and location of French reserves, 535. — Dependence of German steel industry upon Lorraine, 536. — Also of French steel industry, 538. — Probable French policy of control, 540. — Coal production of France and Germany, 544. — Importance of the Saar district, 547. — German pre-war view of importance of controlling iron in the interest of militancy, 552.

THE victory of the Allies in the late world war puts an end — for the present at least — to the pan-German ironmaster's dream of an industrial hegemony based upon national self-sufficiency with regard to the control of the sources of raw materials. This dream was apparently a cause of the war just closed. In the acquisition of Alsace-Lorraine in 1870–71 Germany recognized the possibilities for her iron and steel manufactures involved in the possession of extensive iron-ore fields. The rapid growth of the German iron and steel industry during the two decades immediately preceding the war was based in part upon the control of the iron ores of Lorraine. Had Germany won the war there is little doubt that this control would have been extended over the rich ore fields of northeastern France. The defeat of Germany, however, will not only frustrate her ambition to increase her possessions of valuable ore properties but deprive her of what she had gained in the Franco-German War of 1870–71.

The restitution of Alsace-Lorraine will return to France the possession of over two billion tons of iron

ore, and with the supplies in the adjoining territory of French Lorraine, will give to that country the finest iron-ore basin in Europe, and one of the finest in the world. The magnitude of the iron-ore reserves of Lorraine — both German and French — may be indicated by a brief description of the region in which these deposits are located and a comparison with the total reserves of Europe and with the leading iron-ore fields in other parts of the world.

The Lorraine area forms a part of a great basin of ores (minette) embracing a part of northern France, southwestern Germany, Luxemburg and southern Belgium. The mining region of French Lorraine comprises about 150,000 acres with a possible addition of 30,000 acres.[1] This field is divided into certain folds or basins, of which the basin of Briey is the most important and contains about two-thirds of the estimated supplies of French Lorraine.[2] German Lorraine is somewhat more compact covering an area of about 108,000 acres.[3] This area has supplied the iron and steel industry of western Germany with the greater part of its ore.

In 1910 the actual or proved reserves of iron ore with their equivalent metallic iron content were estimated for the Lorraine region as shown by the table on page 533.[4]

Out of this enormous total of actual or proved ore reserves France, with the possession of what has been German Lorraine, will have in this field deposits amounting to 5,330,000,000 tons, capable of yielding

[1] The Iron and Coal Trades Review (London), December 6, 1918, p. 633.

[2] Bulletin of the American Institute of Mining Engineers, September, 1918, pp. 1492–96.

[3] The Mineral Industry for 1917, p. 357. The Mineral Industry is published yearly by the McGraw-Hill Book Company of New York.

[4] Iron Ore Resources of the World, vol. i, pp. xxvi, xxvii, xliii and xlv. The best survey which has yet been made of the iron-ore resources of the world was that undertaken at the initiative of the Executive Committee of the Eleventh International Geological Congress held in 1910 at Stockholm, Sweden. The results of the survey were published in two large volumes with the above title.

(000's omitted)

Territories	Actual ore supplies [1]	Equivalent metallic iron content	Potential ore supplies [1]
	(metric tons)	(metric tons)	
French Lorraine	3,000,000	1,000,000	
German Lorraine	2,330,000	755,000	Very considerable
Luxemburg	270,000	90,000	
Belgium	62,000	25,000	
Total	5,662,000	1,870,000	

1,755,000,000 tons of iron. The iron-ore reserves of German Lorraine constituted nearly two-thirds of the proved deposits of the German Empire, and those of French Lorraine, over 90 per cent of the estimated total of France. The results of the redistribution of these supplies upon the reserves of the two countries named may be indicated as follows: [2]

(000's omitted)

Time	France		Germany	
	Actual ore supplies	Equivalent metallic iron content	Actual ore supplies	Equivalent metallic iron content
	(metric tons)	(metric tons)	(metric tons)	(metric tons)
Before the war	3,300,000	1,140,000	3,607,700	1,270,000
After the war	5,630,000	1,895,000	1,277,000	515,000

The proved iron-ore reserves of all Europe were computed in 1910 at 12,031,900,000 metric tons with an equivalent metallic iron content of 4,732,800,000 metric tons. The supplies of France, therefore, as a consequence of the war, now constitute over 45 per cent of

[1] The term actual is used to signify proved and commercially valuable ore. Potential is the word used to designate ore supplies which under present conditions cannot be profitably exploited, because of low iron content, unfavorable location with respect to means of transportation, or deleterious ingredients. The dividing line is by no means clearly drawn.

[2] Iron Ore Reserves of the World, vol. i, pp. lxxiii–lxxv.

the estimated actual iron-ore reserves of Europe, and over 40 per cent of their iron content.

All but 300,000,000 tons (a little over 5 per cent of the total) of the French deposits are in a tolerably compact area, and not very far from coal.[1] In these respects the ore resources of France differ from those of other important ore-producing countries of Europe. The remaining reserves of Germany while still great are diffused over a considerable territory. The large supplies of Great Britain[2] are also rather scattered, and those of Russia are distributed over a very wide area. The well-known deposits of Spain and the magnificent reserves of northern Sweden are located in countries or regions with very limited supplies of coal.

The Lorraine region is one of the six leading iron-ore districts of the world. These districts with their reserves, as estimated in 1910, are tabulated below:[3]

LEADING IRON-ORE DISTRICTS OF THE WORLD
(000's omitted)

Territories	Actual ore supplies	Equivalent metallic iron content	Potential ore supplies	Equivalent iron content
	(metric tons)	(metric tons)	(metric tons)	(metric tons)
Lake Superior, U. S...	3,500,000	2,000,000	72,000,000	36,000,000
Lorraine:				
France, Germany, Luxemburg, Belgium	5,662,000	1,870,000	Very considerable	
Northern Sweden.....	1,035,000	670,000	178,000	105,000
Oriente, Cuba.....	1,903,000	856,800	1,007,000	454,000
Bell I., Newfoundland	3,635,000	1,961,000	...[4]	
Minas Geraes, Brazil..	....	....	5,710,000	3,055,000

[1] This coal, however, is mainly within German territory.

[2] Iron Ore Reserves of the World, vol. i, pp. lxxiii–lxxv. The actual reserves of Great Britain were computed at 1,300,000,000 tons with an iron content of 455,000,000 tons. The potential reserves were estimated at a very much higher figure — over 37 billion tons, exceeding that of any other country in Europe.

[3] Iron Ore Reserves of the World, vol. i, pp. xxvi–lxxix. See also Bulletin of American Institute of Mining Engineers, September, 1918, pp. 1472–1479.

[4] The potential supplies of western Newfoundland are given as "enormous." These ores, however, contain much titanium which under present metallurgical processes materially reduces the value of the ore.

Since 1910 some of these estimates in the more recently surveyed fields have changed. The proved reserves of the Province of Oriente, Cuba, are now estimated at 3,000,000,000 tons, and those of Minas Geraes, Brazil, at approximately 3,500,000,000 tons.[1] The resources of northern Sweden are also rated somewhat more highly than the above figures indicate, and the potential ore supplies of the Lake Superior district are materially reduced under later estimates.

The importance of the Lorraine field is not alone indicated by the richness of its ore deposits. None of the other great reserves above tabulated, including even the Lake Superior region of this country, are so favorably situated with respect to the sources of coal and limestone — barring the question of political boundary lines — and so near some of the leading markets for iron and steel goods. The deposits of northern Sweden, Cuba and Brazil are located in regions with a very inadequate coal supply. Even in the case of the Lake Superior deposits which are near enough to the Great Lakes to afford the advantages of cheap water transportation, the cost of ore at blast furnaces at lower lake ports and in the Pittsburgh district is practically doubled by the expense of shipment.[2] It is true that in iron content per unit of output the ores of Lorraine are inferior to those of Sweden, Brazil, Newfoundland, and Lake Superior.[3]

[1] E. C. Harder of U. S. Geological Survey, in Bulletin of American Institute of Mining Engineers, September, 1918, p. 1472. Also page 1479.

[2] The Commissioner of Corporations in his Report on the Steel Industry estimated the book cost of ore at lower Lake ports, including general expenses, taxes and depreciation at $2.64 per gross ton. Of this total the rail freight amounted to $0.67, and the Lake freight, including marine insurance, to $0.74. See Report, Part III, p. 34. Out of a total cost of $2.64, $1.41 constituted transportation charges. Before the outbreak of war in Europe the price of standard non-Bessemer Mesabi ore (51.50 per cent iron content) at lower Lake ports was quoted at an average price for the years 1911–14 at $3.15 per gross ton. About half of that price represented transportation charges.

[3] The iron content of Lorraine ores averages about 35 per cent. The ores of Sweden and Brazil range from 65 to 70 per cent and those of Newfoundland and Lake Superior from 50 to 60 per cent.

It may also be pointed out that owing to the relatively large proportion of phosphorous in these ores they are not suited for the manufacture of certain grades of steel.[1] These disadvantages, however, are more than offset for ordinary iron and steel manufacture by their geographical location.

The importance of the Lorraine deposits is further emphasized by the fact that in the years immediately preceding the outbreak of hostilities they were supplying the bulk of the iron ore of the two leading ore-producing countries of Europe,[2] and were furnishing the raw material upon which their iron and steel industries were built. In 1913 the iron-ore production of Germany (excluding Luxemburg) amounted to 26,771,598 tons.[3] This production was greater than that of any other country in the world except the United States. Of the German output 21,135,554 tons were mined in Lorraine.[4] If the production of Luxemburg amounting to 7,332,000 tons were added to that of German Lorraine we should have an iron-ore output for the Luxemburg-Lorraine district of nearly 28,500,000 tons, and for the territory embraced within the German Customs Union of over 34,000,000 tons.[5] France produced in 1913, 21,572,835 tons of iron ore, of which over 90 per cent was produced

[1] For the making of Bessemer steel, i.e., acid Bessemer, the Lorraine ores are unsuited. For some kinds of manufacture Bessemer steel is superior to basic steel and for some kinds of ordnance material low-phosphorus steel is necessary. Bessemer ore must not contain more than one part phosphorus to 1,000 parts metallic iron. In the case of low-phosphorus ore the proportion of phosphorus allowable is less than half that of Bessemer. The best ore field now known for Bessemer and low-phosphorus ores is that of Brazil.

[2] The production of iron ore in the United Kingdom which ranked third among the countries of Europe was 15,997,328 tons. While the United Kingdom produced less ore than France she surpassed that country in the manufacture of pig iron and steel.

[3] Mineral Resources of the United States, 1915, p. 318. Work published by the U. S. Geological Survey.

[4] The Mineral Industry for 1917, p. 357.

[5] The Iron Trade Review, January 2, 1919, p. 30, and Mineral Resources, 1915, p. 318. The Iron and Coal Trades Review (London) gives the production of Luxemburg for 1913 as 7,332,000 tons. See number of November 5, 1918, p. 517.

mining districts of Briey, Nancy, and Longwy — t is called French Lorraine. Altogether, therefore, rraine field was supplying Europe just before the ith an annual ore tonnage of between 45 and ions.

immense production formed the basis of the ing iron and steel industry of Germany and was ndation of the iron and steel manufactures which own up in France. Without the exploitation of rraine deposits the astonishing development of n and steel industry of Germany would be un- ble, and the acquisition of a large part of these s by Germany in 1871 was doubtless a factor in ing this development. The importance of the ne deposits in relation to this industrial growth is licated alone by the iron and steel manufactures ce-Lorraine, but by the fact that the entire indus- the Rhenish-Westphalia and the Saar districts, led upon Lorraine.[1] These districts are within ach of the region discussed, and with Lorraine- burg produced the bulk of the iron and steel of ny. The pig iron production of Germany in 1913 ted to 19,291,920 tons, and was distributed among ferent provinces in the following proportions:[2]

DETION OF THE TOTAL PIG-IRON PRODUCTION OF GERMANY CLUDING LUXEMBURG) BY DIFFERENT PROVINCES, 1913

District	Percentage
inland-Westphalia	42.5
erland, Lahn, and Hesse-Nassau	5.1
ia	5.2
tral and East Germany	5.2
aria, Württemburg, and Thuringia	1.6
	7.1
aine and Luxemburg	33.3

Trade Review, January 2, 1919, p. 30.

Iron and Coal Trades Review (London), January 16, 1914, p. 97. Figures from the Statistical Bureau of the Verein Deutscher Eisen- und Stahl-Indus-

It will be observed that the Rhenish-Westphalia and Saar districts and Lorraine and Luxemburg produced in 1913 over 80 per cent of the pig-iron output of the territory embraced within the German Customs Union. Historically and geographically the iron and steel industry of these districts is intimately bound up with the mining development of Lorraine.

It is not to be overlooked, however, that Germany in recent years has been a heavy importer of iron ore. While the bulk of this raw material in the pre-war period came from domestic sources the proportion supplied by foreign countries was increasing.[1] In 1913 the importation of iron ore amounted to over 14,000,000 tons, of which 4,558,000 tons came from Sweden, 3,811,000 tons from France and 3,632,000 from Spain.[2] The significant importation from France, however, represents a supply from the same source as the domestic output, but on the other side of a political boundary line.

The French iron and steel industry has been even more dependent upon Lorraine ore than the German. The manufacture of iron and steel, however, notwithstanding the great ore production and reserves of the country, has undergone no such striking development as in Germany. The iron-ore resources of France were nearly as great as those of her neighbor, and the deposits of French Lorraine has been estimated at a higher figure than those of German Lorraine. Nevertheless, while the output of pig iron in Germany in 1913 amounted to 19,291,920 tons, that of France was only 5,311,316 tons.[3] During the same year Germany produced 18,958,819

[1] Commercial Relations of the United States, 1912, published by the Bureau of Foreign and Domestic Commerce, pp. 36–39. In 1911 the importation of iron ore into Germany amounted to 10,820,485 metric tons, and in 1912, to 12,120,000 metric tons.

[2] Iron Trade Review, January 2, 1919, p. 30.

[3] Mineral Industry for 1917, p. 346. The figures are given in metric tons (2,204.6 pounds).

tons of steel, and France only 4,419,241 tons.[1] In other words, France with an iron-ore production equivalent to about two-thirds that of Germany (including Luxemburg) and reserves nearly as great had a pig-iron output considerably less than one-third and a steel production of less than one-fourth.

French iron and steel manufacture absorbed only a part of the country's output of ore. The situation may be indicated by comparing the production with the apparent consumption in the two calendar years immediately preceding the outbreak of war.

CONSUMPTION OF IRON ORE IN FRANCE, 1912 AND 1913[2]

	1912 (tons)	1913 (tons)
Production	18,858,668	21,572,835
Imports	1,454,190	1,417,063
Exports	8,323,712	9,745,863
Apparent consumption	11,989,146	13,244,035

In 1912 the net exports of iron ore of France amounted to 6,869,522 tons with an apparent consumption of 11,989,146 tons, or less than two-thirds of the year's production. In 1913 the net exports were 8,328,800 tons, or considerably more than one-third of the annual production, leaving for home consumption 13,244,035 tons. In other words, the net exports of iron ore from France in the years just prior to the war were about 35 per cent of her annual production. In contrast with this, Germany's imports of iron ore for the same two years were 12,120,090 and 14,017,000 tons respectively, and her

[1] Mineral Industry for 1917, p. 347. The tonnages for steel are given in terms of ingots and castings. A slightly higher figure is given in the Iron and Coal Trades Review, April 10, 1914, p. 541, for the production of steel in France.

[2] Mineral Resources of the U. S., 1915, p. 318, and Mineral Industries during 1913, p. 418.

annual exports only a little over 2,000,000 tons.[1] Germany with an iron-ore production considerably larger than that of France, and including within her tariff boundary line the added output of Luxemburg, had in 1912 and 1913 a net importation of ore equivalent to about one-third of her domestic production.[2]

The war just closed has, by the restoration of Alsace-Lorraine, added to the already great reserves of France the deposits from which the German iron and steel industry has drawn the greater part of its ore. Will this addition result in the transfer of this great industry to France? Does the loss of Lorraine mean the complete or partial demoralization of German steel manufacture?

It is evident that many French writers and statesmen look forward to a development of the iron and steel industry in France corresponding to its wonderful growth in Germany in the pre-war period, and probably greatly surpassing it. The support which the German industry gave to the military operations of the Central Powers has given birth to a desire on the part of many to see this industry in Germany crippled, or at least its Continental leadership taken away.

It is well known that in the manufacture of iron and steel a large amount of coal is consumed. It is also well known that while France possesses some important coal deposits her coal resources are not very extensive and her consumption of coal far exceeds her production. The Lorraine district which has been recently added to her territory brings with it no material addition of coal. The redistribution of territory between France and Germany

[1] Bureau of Foreign and Domestic Commerce: Commercial Relations of the United States, 1912, pp. 36, 39, and Iron Trade Review, January 2, 1919, p. 30.

[2] The production of iron ore in Germany (including Luxemburg) in 1912 was 33,180,258 metric tons and in 1913, 34,103,598 metric tons (26,771,598 for Germany proper and 7,332,000 for Luxemburg). Mineral Resources, 1915, p. 318, and Iron and Coal Trades Review (London), November 5, 1918, p. 517.

virtually amounts to putting iron ore on one side of a political boundary line and coal on the other.

This division of material resources would not seriously affect the economic situation if iron ore and coal were left free, or relatively so, to pass between the two countries under consideration. But this freedom comes into conflict with a strong national purpose to keep French ore at home and make it contribute to the upbuilding of a great iron and steel industry in France. Furthermore the Germany industry being looked upon as something of a military, as well as a commercial, menace Lorraine ore must no longer constitute its basis as in the past. The old interchange of French ore for German coke is pronounced out of question.[1]

How far a political or patriotic purpose can modify an industrial condition depends upon a number of factors. An unwise fiscal policy can injure and sometimes destroy an industry. A tariff barrier may interrupt or change the normal current of trade. But the enactment of a legislative body or the decree of an international council cannot change natural resources or alter geographical facts. Political boundary lines, it is true, may be made to conform to such conditions, but the successful consummation of any political aim depends upon its adaptation to the natural and economic possibilities of the situation.

Are those who look forward to a rapid and extensive development of a French iron and steel industry based upon Lorraine ore justified in their anticipations? Or do such anticipations come into conflict with an economic condition?

It is unsafe to make predictions, as there are many circumstances in the present industrial situation, the

[1] The situation is discussed in a series of articles published in L'Information by M. C. Marquet (Ingenieur Civil des Mines).

influence of which it is impossible to gauge. However, certain facts in this situation may be pointed out, and a rough estimate made of their probable influence. Some of these facts are well-known and appreciated, and others are popularly ignored.

In the manufacture of some iron commodities and most articles of rolled steel, the consumption of coal (including coke) is greater than that of iron ore. The oft-repeated statement that it takes more coke than ore to produce a given amount of pig iron is not true of the product of the blast furnace of today. The tendency for the ore to move toward the coal rather than for the coal to travel toward the ore cannot be explained by the relative quantities of ore and coal necessary to produce a ton of pig iron. This can be seen by comparing the proportionate amounts of material entering and leaving a modern blast furnace when a ton of pig iron is manufactured out of ordinary ore containing about 50 per cent of iron:

Entering the Furnace	(tons)	Leaving the Furnace	(tons)
Iron ore	2	Pig iron	1
Coke	1	Slag	0.5
Limestone	0.5	Gases	6
Air	4		
	7.5		7.5

It will be observed that in the case of 50 per cent iron ore the approximate proportion of coke to ore used in the smelting process is one to two. In the case of low-grade ores the coke consumption is greater, but less than the quantity of ore used. In the manufacture of coke the amount of coal consumed varies considerably, but with superior grades four tons are required to make three tons of coke.

The greater part of the pig-iron production of the world is converted into steel.[1] In 1916 the pig-iron production of the United States amounted to 39,434,797 gross tons, and the steel output (in terms of steel ingots and castings), to 42,773,680 gross tons.[2] In 1913, as has already been noted, the pig-iron production and steel output of Germany were 19,291,920 and 18,958,819 metric tons, respectively, and the corresponding figures for France were 5,311,316 and 4,419,241 metric tons.[3] It is especially in the advanced stages of steel manufacture that the aggregate fuel costs mount high enough to make it an object for the producer to be nearer his coal supply than his sources of iron ore. In the production of certain forms of rolled steel the amount of fuel consumed is as much as four tons of coal to one ton of steel.[4]

In addition to this influence operating on the producing side of steel manufacture is that of the desirability of being near the leading markets for steel goods. The bulk of the steel consumed under modern industrial conditions takes the forms of railway material including rails, structural shapes, heavy machinery, plates, and the like, and the principal markets for such products are in great manufacturing centers located near coal-producing regions.

As long as coal remains the most important source of power in the operation of modern machinery and its consumption per unit of steel output continues to be practically what it is at present, the iron and steel industry will tend to seek the coal area. Lake Superior ore will

[1] The conversion usually takes place in one heat, i.e., the iron is not allowed to cool before bringing it to the Bessemer converter or the open-hearth furnace.

[2] Annual Statistical Report of the American Iron and Steel Institute, 1916, pp. 3 and 23. The apparent statistical discrepancy in the outputs of pig iron and steel is explained by the large use of scrap material in steel manufacture.

[3] Mineral Industry for 1917, pp. 346 and 347.

[4] The writer is indebted for this information as well as other technical details embodied in this article to Bradley Stoughton.

move toward Pennsylvania coal rather than Pennsylvania coal toward Lake Superior ore.[1] Swedish ore will travel toward German and English coal rather than the coal in the reverse direction.

The situation with respect to coal, brought about by the restitution of Alsace-Lorraine to France, may be considered with reference to the coal production and trade of that country in comparison with that of Germany, the comparative resources of the two countries in the bituminous product and the efforts and proposals of French writers and statesmen to meet the situation.

The production of coal in France and Germany, in the two calendar years immediately preceding the war, given in short tons, were as follows:[2]

	1912	1913
France	45,534,448	45,108,544
Germany	281,979,467	305,714,664

The output of Germany in each of the years considered was between six and seven times that of France. In both France and Germany production was largely concentrated in a few districts. About 70 per cent of the output of France came from the Nord and Pas-de-Calais districts — the latter producing about half that of the country.[3] The mining of coal in Germany, while operated on a fairly large scale in various parts of the country, is most extensively carried on in the Ruhr district, the output of which was about one-half that of the empire in 1912 and 1913.[4]

There have been some apparent movements in the United States which seem to run counter to this principle, e.g. the organization of the Minnesota Steel Co., a subsidiary of the United States Steel Corporation, at Duluth, Minn. Coal is shipped from lower Lake ports to Minnesota. It should be remembered, however, that coal is carried on the Great Lakes at exceptionally low rates and as a return cargo for ore-bearing steamers. Furthermore the company produces heavy steel for markets in the Northwest — particularly railroad material, structural shapes, etc.

[1] Mineral Industry for 1917, p. 127.

[2] Ibid., 1913, p. 118. [4] Ibid., 1913, p. 119.

In both countries the production of bituminous coal exceeded that of anthracite [1] and lignite. In Germany much of the bituminous product makes good coke.[2] In 1913 the production of coke in Prussia amounted to 34,000,000 tons.[3] In France, on the other hand, good coking coal is scarce, and in 1913 the French output of coke was only about one-tenth that of the Prussian production.

The coal and coke consumption of France far exceeds her production. In 1913 the coal imports amounted to 18,693,123 tons, this importation being an increase of more than 2,700,000 tons over that of the preceding year.[4] During the same year the French consumption of coke for metallurgical purposes was about 6,500,000 tons,[5] but of that consumption 3,070,036 tons were imported. Considerably over half the imported coal came from Great Britain, and about four-fifths of the coke from Germany.[6]

In contrast with this, German coal and coke production exceeds consumption. For many years Germany has been one of the world's great exporters of coal. In 1913 the net exports of coal from that empire aggregated over 24,000,000 tons, and those of coke about 6,000,000 tons.[7]

[1] A small amount of anthracite is produced in both France and Germany, but it is inferior to the anthracite of eastern Pennsylvania and South Wales.

[2] Coke is a product of bituminous coal, but not all bituminous coal is coking coal. Experiment is necessary to determine whether a given coal has the qualities necessary for making good coke. These qualities cannot be stated in chemical terms alone. See Tiemann, Iron and Steel.

[3] The Iron and Coal Trades Review (London), December 13, 1918, p. 673.

[4] Mineral Industries during 1913, p. 118.

[5] The Iron and Coal Trades Review (London), December 6, 1918, p. 633.

[6] Mineral Industries during 1913, pp. 118–120.

[7] Ibid. The exports of coal and anthracite were 34,573,514 tons, and the imports were 10,540,018 tons. The coke exports amounted to 6,411,418 tons. There was a small importation of coke from Belgium.

The coal reserves of France, as estimated in 1913,[1] do not promise very much in the way of any large permanent increase of output. The reserves of bituminous coal, which is the fuel of iron and steel manufacture as well as of other manufactures, were estimated for France, Germany, and Europe as follows:[2]

(000's omitted)

Countries	Actual reserves	Probable reserves	Total
	(tons)	(tons)	(tons)
France	3,622,000	9,058,000	12,680,000
Germany	94,865,000	315,110,000	409,975,000
Europe	236,716,000	456,446,000	693,162,000

The largest reserves of bituminous coal in Europe are in the Belgian-German basins. The British fields are more easily exploited and a larger percentage of their reserves extracted.[3] But the basins named, particularly Germany, have much larger amounts. Of the total estimated European reserves of bituminous coal (actual and probable) nearly 60 per cent is in Germany and less than 2 per cent in France.

The coal reserves of France and Germany remain practically unaltered by the transfer of Alsace-Lorraine to France. The distribution of the bituminous coal reserves within Germany shows that this transfer affected no appreciable change in the fuel situation.

[1] A survey of the coal reserves of the world similar to that of the iron-ore resources was undertaken by the International Geological Congress held in 1913 in Canada. The results were published in three large volumes under the caption "The Coal Resources of the World."

[2] The Coal Resources of the World, vol. 1, pp. xxxv and xxxvii. These reserves are divided in the case of Europe into "actual" and "probable." Actual reserves are those where the actual thickness of the seams may be arrived at, and probable reserves are those where an approximate estimate only may be made.

[3] The Coal Resources of the World, vol. 1, p. xxvi.

BITUMINOUS COAL RESERVES OF GERMANY BY DISTRICTS [1]
(000's omitted)

Districts	Actual reserves	Probable reserves	Total
All Germany	94,865,000	315,110,000	409,975,000
Saar district	16,548,000	....	16,548,000
Westphalia	56,344,000	157,222,000	213,566,000
Lower Silesia	718,000	2,226,000	2,944,000
Upper Silesia	10,325,000	155,662,000	165,987,000
Saxony	225,000	....	225,000
Left of Rhine	10,458,000	....	10,458,000
Other districts	247,000	....	247,000

Of the districts tabulated — and they include all the bituminous coal reserves of the former German Empire — only that designated left of Rhine covered any part of the Lorraine region, and that only in a limited degree. The Saar district is in very close proximity to the Lorraine field. The Westphalian district, which is by far the largest and most highly developed of the coal regions of the country, has been the principal seat of the iron and steel industry of Germany. This industry has depended in the main upon ore from German Lorraine and to a limited extent upon supplies from the adjoining field in France.

The relatively restricted supply of coal has been the cause of the high prices charged for that fuel in France. Figures have been published concerning average prices of coal in France, and comparisons made with the corresponding prices in other countries. Recently these figures have been used for determining the effect of fuel costs upon the prices of iron and steel goods,[2] and the results are significant. In 1913 according to these esti-

[1] The Coal Resources of the World, vol. i, p. xxxvi.

[2] An account of these computations is given in the Iron and Coal Trades Review (London), January 10, 1919, p. 47. In stating the figures the writer has converted them into American currency.

mates the price of French coal at the pit was $3.32 per ton and that of imported coal $4.74. Worked out on the basis of the amounts produced in the country and imported the average price was $3.55 per ton. This average exceeded that of the United States by $2.28, that of England by $1.32, and that of Germany by $0.96. In the case of home-made coke the average price in France was $4.37 per ton, and that of imported coke $5.63, with an average price for both of $5.11. This estimate exceeded the averages of the United States, England, and Germany, by $2.69, $1.76, and $0.82, respectively.

These figures have been used to show that the normally high prices of pig iron and finished steel material in France are, to a great extent, the result of the cost of coke and coal. The production of a ton of pig iron requires not less than a ton of coke, and generally in Europe, appreciably more. The conversion of this pig iron into finished product necessitates the use of at least a ton of coal, and in some cases two or more tons. Higher fuel prices are thus an important factor in increasing iron and steel costs in France over those of the United States, England, and Germany. A computation based upon similar but somewhat later figures, made by M. de Nanteuil, State Mining Engineer, shows that the cost of producing pig iron is increased in France because of the higher cost of coke by $1.35 per ton over that of Belgium, $2.71 per ton over that of Germany, $4.07 over that of England, and $4.87 per ton over that of the United States.

While these calculations may not be in all cases accurate and may even contain some serious errors, they do show how the high fuel prices prevailing in France have affected iron and steel costs and limited the competitive strength of the French iron and steel industry. Unless the fuel problem is solved iron and steel manufacture in

France seems destined to be carried on at high cost, or Lorraine ore to continue to serve the steel mills of Germany. The latter alternative is deemed by Frenchmen out of question.[1]

The significance of the situation is fully appreciated in France. Reasons other than large ore deposits influenced Frenchmen to look forward to the restoration of Alsace-Lorraine. The iron-ore deposits, however, constitute by far the most valuable natural resource of these provinces, whose economic development depends in large part upon their exploitation and utilization. To promote this development without making French ore subsidiary to German iron and steel it has been suggested and strongly advocated that the Saar basin to the northeast be annexed to Lorraine.[2] This district, as has already been pointed out, is one of the prominent coal-producing regions of Germany. It has also been the seat of a flourishing iron and steel business, which like the more important manufacturing district of Westphalia has depended upon Lorraine ore.

The Saar district, however, while containing large coal deposits, only meets the situation partially. Its resources are not commensurate with the enormous demands which would be made upon it in the event of such a growth in the French iron and steel industry as is anticipated by certain writers. The coke production of the district is neither large nor high in quality. Thus out of a total output of 17,846,000 tons of coal in the basin of the Saar in 1913, only 3,292,000 tons were converted into coke,[3] which was consumed for the most part locally. Furthermore finely washed coking coal in this district yields only 65 per cent coke, whereas the superior coking

[1] The Iron and Coal Trades Review (London), December 6, 1918, p. 633.

[2] Bulletin of the American Institute of Mining Engineers, September, 1918; Iron and Coal Trades Review, January 10, 1919; Washington Post, January 13, 1919.

[3] The Iron and Coal Trades Review (London), January 10, 1919, p. 47.

coal of Westphalia and of England yields from 72 to 76 per cent coke.

It is reported that during the war means have been discovered for coking at a low price coal hitherto declared to be unsuitable for the purpose. While it is true that only laboratory tests have been applied, it is considered beyond doubt that so far as coke manufacture is concerned an industrial solution is in prospect. With such a solution it is held that the incorporation of Alsace-Lorraine and the Saar, after deducting the needs for domestic consumption, gas works and railroads, would result in a production of 12,000,000 tons of coal capable of being transformed into coke [1] and rendered available for the blast furnaces of France. Twelve million tons of coal would, under the new processes referred to, make from 8 to 9 million tons of coke — or between two or three times the domestic output of France in 1913, but only about one-fourth the production of Prussia during the same year. Assuming all considerations of language and present ethnic relationship on the part of the people of the Saar district to be set aside and the region incorporated with Lorraine, the prospective development of a great French iron and steel industry commensurate with her enormous ore supplies would still confront a fuel problem.[2]

The effect upon Germany of the loss of Lorraine will depend very largely upon the policy adopted by France with regard to the exportation of ore to her neighbor. It has already been noted that the German iron and steel industry has in the main been based upon the Lorraine ore field. This relationship extended not only to Ger-

[1] The Iron and Coal Trades Review, January 10, 1919, p. 47; Bulletin of American Institute of Mining Engineers, September, 1918.

[2] It has been reported that at the Peace Conference in Paris, those of the French who strongly advocated the annexation of the Saar basin to provide coal have receded from their position. Iron Age, January 30, 1919, pp. 315 and 316. The temporary control of this region by the French, however, seems to have been agreed to as part of the indemnity to be paid by Germany to France. Washington Post, April 2, 1919.

man Lorraine, but to the part of the field embraced within Luxemburg and to a less extent to the district within France. If the supply of ore is cut off from all that part of the Lorraine region now to be embraced within the boundaries of France, Germany will be shut out from sources which supplied over 50 per cent of her iron ore in 1913, including her large importation.

The situation for Germany in the event of the elimination of these sources of ore supplies is even worse than this. The mining interests of Luxemburg are closely associated with those of Alsace-Lorraine, and if the iron ores of the latter become a basis for a great French iron and steel industry, Luxemburg is likely to become associated with France, and to separate from the German Customs Union. A statement recently made by the general director of the Burbach-Eich-Dudelingen Company and the reservations he made in connection with the provisional prolongation of the Steel Syndicate lead to the conclusion that this possibility exists.[1] In 1913 Luxemburg produced 7,332,000 tons of ore, or over one-half million tons more than the German Empire outside of Lorraine.

It has been contended that Germany may still look abroad for the greater part of her ore. Large quantities of Swedish and Spanish ores were being imported prior to the outbreak of hostilities. This importation, however, would have to be increased manyfold to compensate her for the loss of Lorraine, and preserve her iron and steel industry on the pre-war level.[2] If iron ore no longer moves from Lorraine to the Rhenish-Westphalia and Saar districts (assuming that the latter remains a

[1] The Iron and Coal Trades Review (London), December 6, 1918, p. 633, and November 29, 1918, p. 611.

[2] The difficulties which the Germans have experienced in securing iron ore in other countries is treated in a report from Consul General Halstead at Stockholm to the Bureau of Foreign and Domestic Commerce. See also Iron Age, January 30, 1919, p. 239.

part of German territory) the backbone of the present German iron and steel industry will be broken.

A confidential German document, which has recently been published by the Comite des Forges de France and quoted in the *Iron Age*,[1] gives some idea of the attitude of steel producers in Germany toward the control of the sources of iron ore, both from an industrial and a military standpoint, and also shows the cause of the apprehension naturally felt in France with regard to furnishing the raw material for German iron and steel manufacture. This document, which was probably written at a time when Germany was confident of a victory, emphasizes the determination of that country to take possession of the French mines, considered imperatively necessary in order to insure the future prosperity of the iron and steel industry of Germany. After pointing out that for many years Germany has been obliged to depend on other countries for a part of its supply of ore it remarks that " our mining base enlarged by the addition of Briey and Longwy would insure for a century the future of our iron industry, and would hence insure also our retention of the place which, with the help of the iron ore of Lorraine, we have conquered during the last ten years among the iron-making countries of the world, at the cost of hard struggles with Great Britain."

It also states that the greater the iron and steel-making resources of a country the more it is dreaded as an adversary. It then goes on to say that the displacement of the Lorraine frontier is absolutely indispensable for the safety of the German Empire in the case of a future war, and adds further:

" All of Lorraine in the hands of Germany would constitute not only a war indemnity and a support for the

[1] Iron Age, February 20, 1919, p. 506.

German fatherland, but also a guarantee of a lasting peace and a gauge for the security of the empire. Our victory gives us the occasion and the right to add to the most vulnerable point of attack on the German Empire a sharp rock against which every enemy assault will be broken.

" If this opportunity be neglected, the German people will in a future war be doomed to ruin."

The failure of Germany to secure the displacement of the Lorraine frontier in the manner contemplated is looked upon in that country as a calamity to its steel industry,[1] involving as it does not only a loss of political control over an area deemed necessary to national safety but a possible elimination of the most important source of its supply of raw material. The German industry still entertains some hope that France's need for fuel will ultimately force her to exchange ore for coke; but any tutelage in regard to coke is what France sincerely desires to avoid.

The attitude of France with reference to the exportation of iron ore is of course intelligible in the light of the experiences through which she has passed and in the face of exposures like the document above cited. It is not to be attributed to commercial particularism with which France has sometimes been charged. The ambition to make her enormous ore resources serve a home industry rather than the industry which was lately used by a powerful neighbor to despoil her of those resources is laudable from both a patriotic and ethical standpoint. The fact remains, however, that metallurgical processes being what they are and the resources of Continental Europe in ore and coal distributed in the manner above

[1] The Iron and Coal Trades Review (London), December 6, 1918, p. 633; Iron Age January 30, 1919, p. 329.

described [1] the economic feasibility of any taboo on an interchange of ore and coke between France and Germany, is, to say the least, very questionable. The iron ore problem of Lorraine, viewed in the light of the present technical processes of iron and steel manufacture, is a good example of how political aspirations and ethnological considerations may come into conflict with an economic situation.

ABRAHAM BERGLUND.

WASHINGTON, D. C.

[1] France is well supplied with water-power which would be available if electric steel could be made as cheap as Bessemer and open-hearth. The progress in the manufacture of electric steel, while great, does not at present promise much in the way of supplanting the product dependent directly upon coal and coke.

NOTES AND MEMORANDA

A PECULIAR EIGHT HOUR PROBLEM

SUPERFICIALLY, it would appear as if the problem of payment for longshore labor in loading and discharging cargo would be relatively simple, especially by contrast with the complicated schedules of railroad employees. But the occurrence of many local customs and the variety of practice between different ports introduce elements of confusion, well illustrated in the following cotton rollers' case.

Longshore labor engaged in loading cotton bales at New Orleans is divided into gangs; and each gang is made up of so-called screwmen, who work in the ship's hold, and of so-called rollers, who wait on these gangs on the dock. The task of the latter group is to head the cotton, that is to say, to keep a supply of bales headed up on end within convenient reach of the screwmen who stow it into place. This work of the roller is not laborious comparatively, nor does it require any skill. But, on the other hand, it is more or less intermittent, depending upon the activity of the screwmen, the supply of bales and the particular needs of the ship's hold. Moreover, the cotton rollers are expected to leave the dock in good condition with bales safely covered with tarpaulin and neatly stacked. In addition, the cotton rollers, " waiting on gangs," are dependent for their hours entirely upon the screwmen; and the screwmen at New Orleans have always enjoyed the custom of a half-hour rest period at 9 o'clock and at 3, known as lunch or whiskey time. During this interval the roller is not supposed to work except upon cotton, and customarily this hour has come to be one of enforced idleness.

The above mentioned local conditions do not prevail at Galveston where the roller is a part of the gang and is paid like the others by the bale. Moreover, no half-hourly rest periods have ever been granted. There are no stevedores or middle-

men as at New Orleans where the steamship companies contract with the stevedore by the bale, while he in turn arranges for his labor on the basis of time.

The introduction of the eight hour day by an award of the National Adjustment Commission in October, 1918, brought about a substantial increase in wages all along the line. The hourly rate for longshoremen was increased from 50 cents to 65 cents; and the working day was brought down to the eight hour limit. But this change affected the cotton rollers peculiarly. Formerly, they always received ten hours' pay, from 7 A.M. until 6 P.M.; altho actually, owing to attendance upon the screwmen, their working hours were only eight. In other words, they stopped when the screwmen stopped at 5 o'clock, an hour ahead of general cargo men; and they also enjoyed the two half-hours of relaxation, over and above the dinner hour. This advantage of the cotton roller, which formerly compensated him for the intermittency of his work was automatically changed into a disadvantage when the general cargo men began to close their working day at 4 o'clock. Under the new conditions the roller still worked until 5, waiting on the screwmen, who were content as before with their conditions, which were in effect, as above described, already eight hours. Large numbers of workers were affected by these conditions, and the port of New Orleans was tied up by a failure of the various parties to come to an agreement. It was to settle this strike that the award printed herewith was handed down.

There were four possible money settlements to be awarded. The extreme demand of the rollers was for ten hours' pay for eight hours' work at 65 cents per hour. They contended for $6.50 per day, upon the ground that the screwmen, whose time they followed, had always been on an eight hour day and were not affected by the changed schedule at all. A second settlement was actually made by some companies upon the basis of eight hours at 65 cents, with $1.00 — the prescribed overtime rate — for the ninth hour. The sum of $6.20, in other words, would pay the men for waiting about during two lunch periods of a half-hour each and actually reward them at the full overtime rate despite this circumstance. Many

employers contended that this was unjust to them. A third choice proposed payment of the straight hourly rate of 65 cents for nine hours' work, which was the outside limit of the roller's working day, as it had always been. This would have given a daily wage of $5.85. And then, finally, some employers contended that, in view of the actually enhanced hourly rate, the eight hour day should be paid for at the rate of 65 cents for eight hours only, such being the number of hours really worked. This would have given the rollers $5.20 for staying on the piers until 5 o'clock, whereas the general cargo men concluded their eight hours at 4 o'clock, and drew the same pay.

The opposing contentions were finally settled by the award which is reprinted herewith, and which is offered as a significant example of interpretation. One way to settle the strike would have been to make an entirely new adjustment, striving to adjust the rollers' wages to those of general cargo men, purely upon industrial or economic merit. But such an industrial settlement had to be aligned with the content of the several contracts and awards which were then in effect. So that the final decision, necessary to claim allegiance of all parties concerned, had to be at once economically just and strictly logical. In other words, it had to be both good law and good industrial practice. In a long, fairly extended experience in these matters, I have seldom felt more completely satisfied that these two modes of approach were comprehended than in this case. And the best evidence, practically speaking, was that despite the large financial interests involved, a unanimous finding was had. The peculiarity of many of these proceedings is that the leading counsel for either side is apt to be chosen as members of the board of award. These attorneys thereafter sit upon the bench and vote upon their own arguments. It was a tribute to the invitableness of this determination that despite the bitterness of feeling which formerly prevailed, a unanimous opinion was handed down.

WILLIAM Z. RIPLEY.

Decision Rendered by Special Adjustment Board in the Controversy between the Stevedores and Longshoremen's Benevolent Association, New Orleans, La., and New Orleans Steamship Association and Stevedores in the Matter of Wages of Rollers of Cotton and Tobacco, February 24, 1919.

The task submitted to your Wage Adjustment Board is the interpretation of an existing contract and of two official awards thereunder. No power to make new rates of wages by agreement was conferred. The original agreement is a contract between the longshoremen and the steamship agents for a period of three years from September 16, 1917. Two subsequent awards dated November 2, 1918, were made by the National Adjustment Commission for the cotton screwmen and for "general longshore work" respectively. The first of these awards for the screwmen changed the rate of wages, but introduced no change in the working hours for cotton gangs, leaving them at nine hours per day; namely, from 7.00 A.M. to 5.00 P.M. as outside limits. The second award for "general longshore work" not only increased the rate of wages from 50 cents to 65 cents per hour, but it also introduced a basic working day of eight hours from 7.00 A.M. to 4.00 P.M. with $1.00 per hour for overtime.

The precise point submitted for determination is as to the standard day's compensation for longshoremen waiting on cotton and tobacco gangs, both under these two awards and under the unexpired original contract.

First: Longshoremen waiting on gangs stowing cotton or tobacco are in no way specifically mentioned either in the award for screwmen or for "general longshore work." The second clause of the general longshore award merely states that "general cargo men" shall receive 65 cents and $1.00 per hour. But in addition it specifies differential rates for handling grain, cement, bananas and other commodities. It has always been the custom of the port to regard cotton and tobacco gangs as engaged in a service separate and distinct from that of general cargo. Thus the omission of any mention of cotton or tobacco rollers would seem to exclude them entirely from the changes introduced by the award for "general longshore work." But, on the other hand, examination of the record of the hearing on October 30, 1918 proves that it was the intention to include them under this award. Your Board finds, therefore, that cotton and tobacco rollers are entitled to the increased rate of 65 cents per hour from and after the date of the award.

Second: If, under Section 2 of the general longshore award, the men are entitled to the new rate of 65 cents per hour, the intention is established of applying this award in general to them as well as to general longshoremen. But the award, if applied as to Section 2, must be held to apply as regards Section 1, which introduces a basic eight hour day. There is no escape from this logic. It is the invari-

able practice not only of courts but of all arbitration tribunals to require that the whole of an instrument applies if any part thereof is applied. Your Board finds, therefore, that the basic eight hour day was intended to apply to cotton and tobacco rollers. They cannot be found entitled to the new rate of 65 cents while still working under a ten hour schedule. Either one or the other might hold good, according as they are comprehended under the award or not. But both cannot possibly apply.

Third: Cotton and tobacco rollers have, both before and after these changes, worked on a nine hour basis waiting on the screwmen's time; namely, until five o'clock P.M. If, however, as already held, they are entitled to a basic eight hour day ending at 4.00 o'clock, your Board finds that they are entitled to overtime at the rate of $1.00 per hour for the additional service up to 5.00 o'clock. This fixes the standard pay for a day's work at $6.20; namely, eight hours at 65 cents and one hour of overtime at $1.00.

The foregoing interpretation is based upon the awards of the National Adjustment Commission. It is necessary to justify the foregoing rate also by the terms of the original contract between the longshoremen and the steamship agents. This contract contains the following clause:

> " Members waiting on gangs shall receive gangs' time in the full sense of the word."

It is agreed by all parties, as already stated, that the time of a cotton or tobacco gang has remained unchanged at nine hours. This clause, therefore entitles them to pay for nine hours work. The proper compensation for nine hours work under a basic eight hour day is identical with that already figured at $6.20. This calculation based upon the contract therefore agrees literally with the calculation based upon the award.

In the application of the foregoing interpretation we hold furthermore that longshoremen waiting on cotton or tobacco gangs, shall be paid for the customary lunch hours of cotton screwmen — namely, 9.00 to 9.30 A.M. and 3.00 to 3.30 P.M.

W. Z. RIPLEY, *Chairman*,
W. H. HENDRON (*For steamship agents*),
J. E. BYRNES (*For the longshoremen*).

COST OF PRODUCTION AND PRICE

INTERESTING questions of theory are raised by Dr. Taussig's article on price-fixing. What are the economic forces that determine long-run or normal price? At one time economists were content to say that it was the cost of production. When it was discovered that there were many costs of production, the question arose, which? The question had already been answered in the case of commodities subject to the law of diminishing returns that it was the highest or marginal cost. President Walker then attempted to extend the same doctrine to all commodities with his well-known theory of the "marginal entrepreneur" and "rent of ability." There were different degrees of fertility in gray matter as well as in land. In this theory the normal price is clearly the cost of production to the least efficient entrepreneur, whom the increasing demand for the product calls into being.

Recent economists, while adhering to the doctrine of marginal cost as a price-determinant in the case of commodities subject to the law of diminishing returns, have been disposed to accept Marshall's theory of the representative firm in the case of commodities subject to the law of constant or decreasing cost. It is not towards the cost of production to the least efficient producer that price gravitates, they say, but to that of the well-established, solid business man — the man doing a conservative, prosperous, but not phenomenally brilliant business. The latter, the great "captain of industry" may be conceded, even in Marshall's theory, to reap a rent of ability. The high-cost producers, those whose costs are greater than that of the representative firm, are not tending to establish normal price, they are tending to effect their own elimination. Every year a sheaf of failures is thrown off, but every year a new sheaf of failures appears. The individuals change, the class is constant.

It may be remarked as a comment on this theory that a single year is too short a period to determine which of the

competing firms is the representative firm whose cost determines normal price. Accident, a poor season, the newness of the business bring it about that every year some of the competitors produce at a cost higher than the price, and hence are doing business at a loss, who nevertheless in the long run are doing a profitable business. Such will ordinarily be the history of the hypothetical representative firm itself. Good years will offset bad years. However, making allowance for such vicissitudes and taking long-time averages, Marshall's theory appears to be more in harmony with facts. It is not the highest-cost firm nor yet the lowest-cost firm that determines normal prices, it is a firm somewhere intermediate between them.

But, after all, Marshall's theory is supplementary rather than antagonistic to Walker's. President Walker was applying economic reasoning to a human society much as a mathematician applies the principles of applied mechanics to the construction of a bridge. He works out his strain sheet as tho all the struts and ties were mathematical lines, as tho they were uniform in texture throughout, as tho they met at geometrical points. He knows as well as the practical bridge builder that not one of these conditions is realized in fact. Yet his strain sheet is none the less valuable and, even after allowing an adequate coefficient of safety, results in great saving of material. So Walker for the purposes of theory assumed a standardization, a fluidity in the action of economic forces operating in a human society which he would probably have been the first to admit is not to be realized in fact. The moment the supply of commodities which the most efficient entrepreneur is able to turn out is insufficient to meet the demand, and a rise of price follows, he supposes another entrepreneur to step in of precisely the right degree of mediocre ability just barely to reimburse himself at the slightly advanced price.

Now what Walker assumed in regard to different grades of entrepreneurs is precisely what Ricardians assume in regard to land. They also are presenting for the purposes of theoretical reasoning hypothetical conditions which they know well

enough can never be more than roughly approximated in actual life. There will always be a fringe of land that is worked at a loss. The cost of production that determines or, better, equals normal price is never the marginal in the sense of highest cost of production. A certain number of producers will always be found occupying land which is as yet of too low a grade to reimburse them at the current price of the product. Even if land could be conceded to be taken up step by step in infinitesimal gradations, the human factor cannot be omitted. Even then it would be the representative firm operating marginal land that would produce at the price-determining cost. The business genius or the business weakling operating marginal land would produce at a cost, the one less, and the other more than the normal price. In short the two theories are seen to be in fact the same theory, except that in one an attempt is made to adjust reasoning, applicable to an hypothetical society, to an actual society. Walker's marginal entrepreneur operating in a conceptual society becomes Marshall's representative firm operating in an actual society.

But when this is admitted we seem at once to make the whole theory valueless for any practical application. So long as we could conceive ourselves to be working in a society, shall I say, geometrically perfect, we had only to collect from all firms statistics as to their costs of production, tabulate the costs in order, and then note which was the highest, in order to determine the normal price. But if the marginal cost or the representative firm cost is not the highest, which one is it? We are driven, perforce, to reverse the process, to determine by averaging price data what is the normal price, find which of the costs is equal to it and call that cost the marginal or representative firm cost. That is, we make normal price determine marginal cost. Having done this, to go on and say that it is marginal cost which determines normal price is to reason in a circle. In truth, neither does marginal cost determine price, nor does price determine marginal cost. Both are results of a more primitive underlying force. That efficient force is human want measuring itself against resistance, whether the resistance be the limitations of nature or human

nature, land or brain. Under the impulse of this underlying force, as human want, manifesting itself in demand, presses against land and brain limitations there result a price and a series of costs, tangible evidences and measures of both want and resistance. Among these costs one will be found equal to the price, and so long as the conditions of want and resistance remain the same that cost and price remain the same. The price, so determined, may be called "normal." Whether we call the cost "marginal" or "representative" is a matter of terminology. In the cost curves so far examined it is found to be near the right hand extremity, indicating that by far the greater portion of the output is produced at a cost equal to or less than that cost. For it, therefore, the term "marginal" is objectionable in that it is too uncompromising; it suggests the absolute last term of the series, the highest cost. "Representative" is objectionable in that it is too compromising; it somehow suggests an average or modal cost, whereas, as just stated, it is ordinarily very near the end of the series. Provisionally, however, and subject to the above explanation, the term "marginal" will be employed in this paper when referring to the cost which is equal to the normal price.

The above analysis is not inconsistent, as might appear at first blush, with the doctrines of constant and decreasing cost. It is merely necessary that they be modified to adapt themselves to an actual society instead of the mentally fabricated society with reference to which they are ordinarily discussed. "Constant cost" implies, that however much the output be increased the price-determining cost will be neither increased nor diminished. It is usually represented by a straight horizontal line, thus adding to the concept of constant cost another concept, unnecessary even for the fictitious society of the economist, that it is also uniform. Even in such a society, if the theory of the "rent of ability" be admitted, it should be an ascending line, with the proviso that as demand increases it should always ascend to the same level at the point where it meets the demand curves, thus:

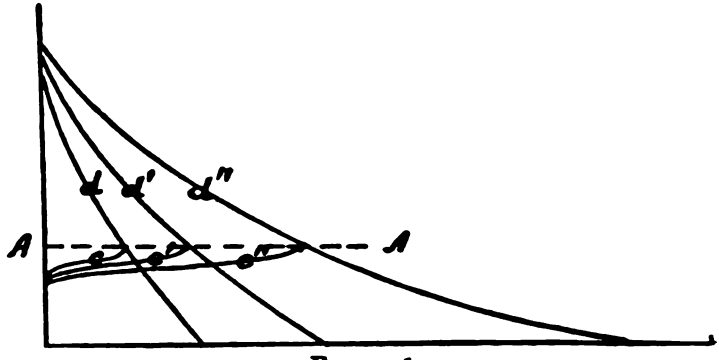

FIGURE 1.

The only difference for an actual society would be that it would cross the demand curves always at the same level, but would extend a short distance beyond them to allow for firms producing at a loss, thus:

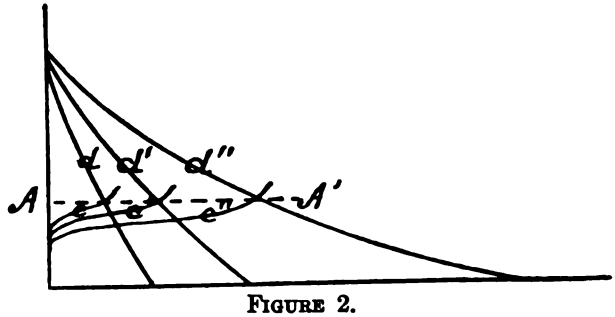

FIGURE 2.

In the case of decreasing cost there would be a series of cost curves crossing the successive demand curves at progressively lower levels as the demand increased, thus:

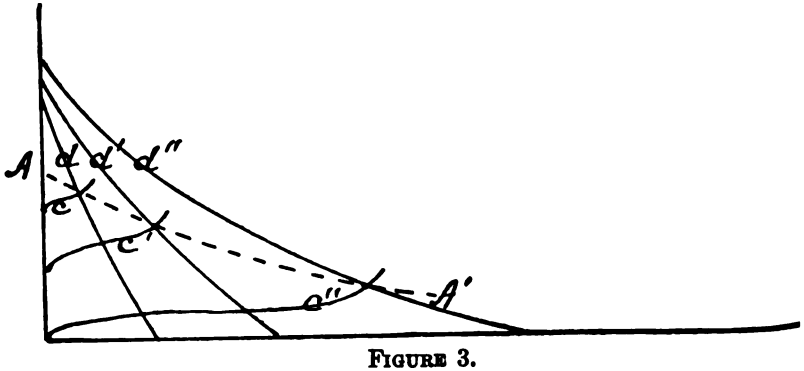

FIGURE 3.

In all the above diagrams, d, d′, d″ are demand curves; c, c′, c″ are cost curves. AA′ shows the levels at which the cost curves meet or cross the demand curves as demand increases, in Figs. 1 and 2 under conditions of constant cost, in Fig. 3 under conditions of decreasing cost.

It was stated that when we so amend the marginal cost theory as to make the marginal cost no longer the highest cost but an intermediate cost, we seem to have rendered the whole theory valueless for practical purposes as a means of determing normal price. Now it is sometimes desirable to determine normal price independently of market price, especially when the latter differs widely from it, as it may in time of war or financial panic. It is also desirable to ascertain normal price when the problem of government regulation of prices calls for solution. In such cases the difficulty referred to may be met by applying the following method.

On the principle of statistical constancy it would seem to be a legitimate assumption, in the case of a large and well-established industry, that, in normal times, about the same percentage of the entire output will be produced at a loss. Having ascertained from cost and price data, collected preferably by a government agency through a series of years, what this percentage is, we can, for the year under study, subtract this percentage from the total output and note what is the highest cost among the costs at which the remaining portion of the output is produced. This cost we may call the marginal cost and consider the normal price as being equal to it.

For example, in a certain region where a considerable portion of the United States supply of sugar is produced, it would appear from pre-war statistics that in normal times about 3 per cent of the output is annually produced at a loss. In the year 1916–17 when an abnormal relation between supply and demand had been brought about by the war, but before government regulation of prices had been attempted, it was found that 97 per cent of the output was produced at a cost not greater than $92.00 per ton, which may accordingly be regarded as the marginal cost or normal price for that year.

The actual price was $124.56 or $32.56 above normal. In the following year, 1917–18, when the price had been regulated by voluntary agreement with the United States Food Administration, the normal price, computed by the same method, would have been $147.00. The actual price was $120.00, or $27.00 below normal.

In connection with the above analysis the writer wishes to emphasize the importance of statistical inquiry as a means of checking and extending economic theory. From the examination of a considerable number of cost curves similar to those shown in Dr. Taussig's article, he was struck with the remarkable family resemblance, whether they were derived from industries to which the law of diminishing returns would presumably apply or not. In all of them there was the same ascending ogee curve, sometimes steep, sometimes more nearly horizontal, but always a curve of the same family type, and in all cases, where the data were at all complete, crossed by the average-price line near its right hand extremity. This unexpected result led him to question whether competition, in the case of industries not subject to the law of diminishing returns, tended to result in a uniform cost for all producers to nearly so great an extent as had been generally supposed, and further led him to question whether there might not be more truth in Walker's theory of marginal and infra-marginal entrepreneurs than recent economists had been willing to admit. Further reflection made it clear that there was no real difference between Walker's theory of the marginal entrepreneur and Marshall's theory of the representative firm. Finally a promising method of handling statistics so as to determine marginal cost and normal price was developed as a result of such theorizing.

It is not the purpose of this article to assert that such cost lines as have been described will be found to exist for all industries. Some industries may be found for which the cost lines are horizontal or approximately horizontal, and in that case it would be interesting to investigate and compare with a view

to determining what are the factors which result in horizontal cost lines for some industries and ascending cost lines for others. Such an investigation would undoubtedly result in a further development and clarification of theory.

PHILIP G. WRIGHT.

AN EMINENT ECONOMIST CONFUSED

THE writer of this note has recently had called to his attention Professor Carver's new and interesting *Principles of Political Economy*. With much that is unusually clear and convincing, it is regrettable to find a vaguely stated and doubtfully valid argument that a protective tariff may add to a nation's wealth by drawing labor out of a line which its employers deem more profitable (under free trade) into one which yields its employers less. Professor Carver's argument, in its most concrete statement, is as follows:[1] "Let us suppose that a certain tract of land had been devoted to cultivation of a fairly intensive kind, and had been producing enough to pay the wages of twenty laborers, with something left over for rent. Through some change of circumstance the price of wool rises, and it is found more profitable to use the land for wool-growing. By turning the land into a sheep run, nineteen of the laborers may be dispensed with, and the saving in wages would more than measure the difference between the value of the wool crop and that of the present crop, so that a larger surplus would be left over as rent. There is little doubt that the land would then be devoted to the growing of wool. That would be to the interest of the landlord and against the interests of the nineteen laborers, but the landlord is in a better position than they to determine the form of cultivation. There is also little doubt that this would be contrary to the interest of the community. Less would be pro-

[1] Principles of Political Economy, p. 360.

duced either for consumption or for international trade. Fewer people could be supported, or the same number would not be as well supported as formerly.

"If the nineteen men thrown out of employment cannot find places elsewhere, they will probably, since they want to live, offer their labor at lower wages — enough lower to enable the landlord to get as much rent from the more intensive form of cultivation as he might get by the less intensive form. Here we have the somewhat anomalous situation of an increase in price in one of the products of industry causing a fall in the price of labor. The key to this anomaly is found in the fact that what is cost to one man is frequently gain to another. Now in this supposed case (which is not altogether a supposed case) there is little doubt that some form of discrimination in favor of the present crop and against wool would increase not only the relative share of the produce going to labor, but the absolute amount of the produce of the land. . . . There lies the opportunity for the protectionist. By some discrimination which will tend to increase the profitableness of the intensive product, or decrease, relatively at least, the profitableness of the extensive product, an absolutely larger and more valuable product might be created. . . . Labor and capital would have been attracted from the less productive to the more productive industry."

The answer which first suggests itself and which the present writer ventured to make some years ago [1] to Professor Carver's argument as it appeared in an article of 1902,[2] is that there are, with reference to the nineteen men who, it is alleged, might be thrown out of work by free trade, two possibilities. Either these nineteen men have a preferable alternative, under the free trade régime, to wheat raising, or they have not. If they have not, they will accept low enough wages, rather than be unemployed and have nothing, so that

[1] See Principles of Commerce, Pt. II, pp. 107–108, note, where Sedgwick and Edgeworth are also criticised for essentially the same error. The writer has since learned that his point was anticipated in a criticism of Sedgwick by Davenport, in the latter's Outlines of Economic Theory, New York (Macmillan), 1896, pp. 197–200.

[2] Publications of the American Economic Association, 3d series, vol. iii, pp. 176–182.

the landowner can realize as much rent for his land as if he used it for a sheep run. Unless their efficiency is thus impaired, they will then produce as much wheat as if they were protected. The effect of freedom from restriction may mean, in this special type of case, lower wages and higher rent, but not decreased national wealth. If, however, the nineteen men have a preferable alternative, they will not raise wheat but will occupy themselves otherwise at higher wages than wheat raising under free trade would yield them, while the landowner will at the same time realize the higher rent assumed to result from using his land as a sheep run. Free trade would then *raise rent more than it would lower wages.*

There is, however, another aspect of the case, which the writer cannot but believe Professor Carver had in mind, tho it seems not to be clearly stated. This is that protection may be one way — not, however, the best or most economical way — of increasing the sum total of utilities. Thus, the wool may be a more profitable product for the landowner only because the class which buys wool is richer than the class which would buy the wheat, and not because it ministers to so important a human want but even in spite of the fact that it satisfies a less intense want. If this is the case, then to divert industry from wool production to wheat production will tend to *increase utilities* whether it decreases values or not.[1] No one should know better than Professor Carver, however, that the best way to remedy the evils flowing from unequal distribution of riches, is not to attempt to discriminate against certain goods as such in the hope of making those goods relatively scarce and hard to get for both rich and poor, while encouraging the production of goods which, in the legislator's view, are most needed by the poor. This is a curiously roundabout and a relatively ineffective and uneconomical method of securing results which can be far more satisfactorily secured by directly taxing those whose incomes are large. It is particularly desirable to do this where these large incomes represent no service

[1] Protection has effects on the distribution of gold and on relative price levels which it is not necessary to consider in the present discussion.

given by the recipients to those from whom they are drawn, as is the case with most of site rent. It is the more surprising that Professor Carver did not call attention to this point since he so clearly favors increased taxes on unearned incomes, and since he advocates increased taxes on land as such (not merely, it appears, on future increases in its value), and on inheritances, as part of his "liberalist's program."[1] Indeed, if a few more economists of Professor Carver's reputation should so frankly advocate land-value taxation, it might almost be possible for younger economists to class themselves as, fundamentally, single-tax sympathizers without thereby losing caste within the profession.

H. G. Brown.

University of Missouri.

A REJOINDER

In case the nineteen laborers decided to accept lower wages and continue growing wheat, there need not be, as Professor Brown points out, any diminution in the total product. The result would simply be lower wages, higher rent, and the same total product as before. This is in agreement with my argument as previously published.

In case, however, the nineteen laborers decide to enter some other calling it must, of course, be a somewhat more remunerative one than wheat growing under the new conditions. It could not, however, be so remunerative as wheat growing had been under the earlier conditions before the assumed rise in the price of wool, otherwise they would not have been growing wheat in preference to following this new occupation. In short, their wages are somewhat reduced by the enforced change as compared with what they were formerly getting, but not so much reduced as they would be if they had no alternative employment but were compelled to con-

[1] Pp. 583–584.

tinue growing wheat at such wages as would leave the landowner as high rent as he might get by turning his land into sheep pasture. When this alternative occupation is open, the changes assumed would raise rent and reduce wages somewhat, but not so much as in the other case.

Will these changes, as Professor Brown says, raise rent *more* than they will lower wages? Yes, if we are thinking of world economy; not necessarily if we are thinking of national economy. In order to find a satisfactory alternative employment, the nineteen laborers may emigrate. In case they do, the national product will obviously be reduced, and will support a smaller population, tho the landowner's rent would be slightly increased. From the standpoint of world economy, the increase of the total productivity of industry is probably not among the theoretical possibilities of protectionism. From the standpoint of national economy, it is. The protectionist is, rightly or wrongly, commonly a nationalist; and from his point of view he finds here at least a theoretical possibility.

T. N. CARVER.

HARVARD UNIVERSITY.

A RE-REJOINDER

IN my criticism of Professor Carver's book, I assumed the alternative industries into which labor would go in case wheat production were abandoned, to be alternative industries *in the same country*. But if, in the supposed case (admittedly, of course, seldom realized) of landowners profiting at the expense of laborers because of free trade, the laborers emigrate, then it is entirely correct to say, as Professor Carver does say, that free trade would diminish *total* national wealth. It deserves to be pointed out, however (and I presume Professor Carver will agree with me in this) that free trade would even then increase the *per capita* wealth of the country in question. It would fail to do this, in a mathematical sense, in one contin-

gency. The average incomes of landowners might be so low and wages so high, that for the wage-earning class to emigrate would leave the average incomes of the landowners and the few remaining laborers lower than the average of the landowners and the more highly paid wage earners had been under protection (altho higher than the average of these same persons's incomes had been). But in any case, the nationalist has the alternative of keeping the home population large and the home production the highest by taxing land rent directly and maintaining free trade, as contrasted with attacking land rent indirectly, uneconomically, and very partially through protection. I trust that these conclusions are consistent with those of Professor Carver as he now states them.

H. G. Brown.

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THE

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FEDERAL OPERATION OF RAILROADS DURING THE WAR

SUMMARY

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r December 26, 1917, the President of the United es issued a proclamation taking possession of the oads of the country, under the powers granted by Army Appropriation Act of August 29, 1916. As a liminary to this profoundly significant step, there e many months of strenuous railroad history. In il the Railroads' War Board had assumed direction the railroads, under a resolution signed by nearly n hundred executives, in which the signatories dged themselves during the war to coördinate their rations in a continental railway system, "merging ing such period all their merely individual and com- itive activities in the effort to produce a maximum of ional transportation efficiency." As the resolution dicated, they desired to be of the greatest service pos- le in the struggle upon which the country was about

to enter. But they had another object, frankly expressed by more than one executive; they proposed to demonstrate to the country that a coöperative organization of private railroad corporations could so successfully meet the situation that government interference with operation would be unnecessary.

Their failure to effect this demonstration was due to many causes. Probably the most potent of these finds its source in the fundamentally competitive atmosphere in which the railroads have always operated. While in many respects actual competition between individual carriers had reduced itself to matters of service alone, yet our entire body of legislation has been constructed on the competitive theory, and we have forbidden railroads to make agreements that would in any way relieve them from the consequences of this principle. When railroads serving the same termini are not permitted under the Interstate Commerce Act to enter into any agreement for the division of earnings, it was not only natural but justifiable that a carrier should resist attempts on the part of the Railroads' War Board to divert traffic to less congested routes. Only an exaggerated patriotism would induce a corporation without compensation to hand its traffic over to a rival. Other conflicts of a similar sort between the competitive and the coöperative principle blocked the attainment of complete success.

Again the railroads were facing a serious financial problem. They had for some years previously been appealing for higher rates, with indifferent success. They were now faced with an unprecedented traffic, and consequently a need for extensions and betterments as well as for generous maintenance, all to be met at rapidly increasing prices of materials. Looming on the horizon were the demands of labor for increases in wages

to meet the steadily increasing cost of living. Increases in rates might have been granted by the Interstate Commerce Commission similar to those later imposed by the Federal Railroad Administration, but aside from the delays involved in the necessary legal procedure — the opposition of shippers, the protracted hearings, the time required for a considered opinion by the Commission — there were the endless difficulties involved in the relations with state commissions. Moreover, altho some of the increasing expense of operation might have been met by such increases in rates, the additional income would have gone but a little way toward obtaining the additional facilities and the plant extensions required. And there was little likelihood of securing capital directly. For it is very doubtful whether their income accounts would have so improved in appearance as to attract investors, in the face of the patriotic appeals for the contribution of all private savings to the winning of the war. Neither was there assurance that even if capital could be lured into the railroad industry, the needed facilities could be obtained. Steel and other materials were being " rationed " and cars and locomotives were going abroad for more direct and immediate war service.

On the operating side, there were serious difficulties that lent weight to the argument for government management. Traffic in the eastern section of the country was unprecedented, including the food and munitions going abroad, the raw materials and coal for the manufacturing section, building materials to supply government contracts, and all the varied and unusual demands created by the war emergency. This traffic was originating in and passing through the most congested section of the country, and that for export was routed without restraint to the usual outlets, because as yet coöperation with shipping had not proceeded far

enough to make any other policy possible. Priority for government freight, a privilege in many cases grossly abused, with no central authority to determine the degree of priority, seriously increased the congestion. Providence added to the complications by a winter almost unknown in its severity. This not only hampered rail transportation, but blocked the marine terminals and stopped the flow of traffic. Motive power kept long in service because there was little opportunity for adequate repairs, was crippled and inefficient. There was no satisfactory coöperation between rail and water service, and many of the Atlantic coastwise vessels were withdrawn by the War and Navy Departments, and the traffic thrown on the railroads.

The operating troubles were almost wholly in the east, and the government might have assumed control only of those carriers that were specifically required for the task in hand, instead of taking possession of the system as a whole. But aside from the fact that it was impossible to anticipate at that time how extensive would be the ramifications of the war needs, and just what lines of railroad would be required, the government might have initiated serious controversies if it had selected certain roads whose earnings were to be guaranteed and whose labor was to be assured the market wage. By the so-called Railroad Control Act approved March 21, 1918, which put the proclamation of the President into effect, it was provided that the President might turn any road back to its owners before July 1, 1918, by which time presumably the government would be in a position to judge whether it would find it wise to operate the system as a whole. Whether if properly backed by the government in their financial policy, in their dealings with labor, and in hurdling the many restrictive statutes federal and state, the railroads could have operated

satisfactorily under private management, is an academic question that need not detain us here. That there was some friction among the carriers themselves and a lack of coöperation on the part of a few, is common knowledge. Yet this might have been overcome in time but for the more serious difficulties. It would probably have been impossible to obtain a suspension of existing restrictive statutes; it was the belief of the President and of many members of Congress that financial aid could not be obtained for the railroads from the government unless the government were in complete control. As the President said in his statement accompanying the proclamation that took over the railroads, "The financial interests of the government and the financial interests of the railways must be brought under a common direction."

With a poor prospect of a prompt increase in rates, a dubious investment market for railroad securities, and a stringency in the materials and facilities needed, the one policy that gave any promise of saving the day was the use of existing facilities and equipment to their absolute capacity regardless of ownership. As a war measure, the taking over of the railroads was, under the circumstances, inevitable and a wholly wise procedure. To quote the President again, "It was thought to be in the spirit of American institutions to attempt to do everything that was necessary through private management, and if zeal and ability, and patriotic motive could have accomplished the necessary unification of administration, it would certainly have been accomplished; but no zeal or ability could overcome insuperable obstacles, and I have deemed it my duty to recognize that fact in all candor, now that it is demonstrated, and to use without reserve the great authority reposed in me. A great national necessity dictated the action, and I was therefore not at liberty to abstain from it."

It should be stated at the outset, that in appraising the results of the past fifteen months of government operation, no attempt will be made to determine from this experience the desirability of permanent nationalization. The period has been a wholly unprecedented one, from which no valid conclusions may be drawn. It is not surprising that many individuals and many journals opposed to government ownership, and fearful that once the government takes hold, it will never let go, should have watched every move with intense interest, and seized upon every unfavorable development as an argument to support their contentions. It is not so clear why those associated with federal operation should have made predictions concerning the results of unified operation that they could not hope to realize. Beyond their natural desire to make the railroads contribute to their utmost in winning the war, they could have had no other wish than to do the best possible job under the difficult circumstances, and the necessity constantly of explaining away unfulfilled promises has only laid them open to the charge of cherishing an ulterior purpose.

The Contract

The President's proclamation ordered the Director General to draw up agreements for compensation, based upon an annual guaranteed rental above depreciation and maintenance, equivalent to the average of the annual net operating income for the three-year period ending June 30, 1917. It was declared that nothing done under the proclamation should impair the rights of stockholders and bondholders to receive just and adequate compensation for the use of their property. Regular dividends and interest were to be continued until and unless the Director General determined otherwise, and

subject to his approval carriers might renew and extend existing obligations. The Federal Control Act, approved March 21, 1918, ratified the terms of the proclamation — that the compensation should be an annual sum equivalent to the average of the net operating income for the three years ending June 30, 1917, to be ascertained and certified to by the Interstate Commerce Commission. It was enacted that every agreement should contain adequate provision for maintenance of property, for its return in substantially as good condition as at the beginning, with provision for reimbursement to the United States for the cost of additions and betterments not properly chargeable to it. Power was given to the President to make special contracts when abnormal conditions, such as a receivership, prevailed during the " three-year test period." The federal administration was to pay interest on any funds expended by a carrier for improvements and extensions, if made with the approval of the President. No carrier without presidential approval could declare a dividend in excess of its regular rate during the three-year test period. A " revolving fund " of $500,000,000 was created, out of which, in addition to meeting the expenses of federal control and the compensation of carriers, provision might be made for terminals and equipment. The President might order any carrier to make additions and betterments or provide terminals and equipment, and might make advances from the revolving fund with proper provisions for interest and reimbursement. If the contract was not accepted by the carrier, the President was authorized to pay to it 90 per cent of the estimated compensation, provision being made for adjudication of the issue by a board of referees appointed by the Interstate Commerce Commission, with final appeal to the Court of Claims.

Under the guidance of this statute, negotiations were undertaken between the Railroad Administration and the carriers for the construction of a "standard contract." So many were the issues involved that the final form was not agreed upon until October 22, 1918, and so varied were the problems of adjustment and the claims for special consideration on the part of the individual carriers, that many of the companies have not yet signed the agreement. Many carriers have announced their intention to follow the method of adjudication provided by the statute.

It is unnecessary to enter into the technical details of this agreement. It follows the provisions of the Federal Control Act already described, and only such points need to be mentioned as will throw further light upon these statutory requirements. The Railroad Administration agreed to meet operating expenses and normal taxes, and to maintain the property and equipment up to the standard prevailing when the road was taken over; but if during the test period, the maintenance appropriations had not been sufficient to put the property in condition for safe operation, additional maintenance up to a normal standard might be provided at the expense of the company. Improvements to railroad property and new equipment were chargeable to the roads, and were to carry interest as rental payable by the Director General, but strictly war improvements were a charge against the government. The annual compensation, payable whether earned or not, was not subject to any deductions that would prevent the company from supporting its corporate organization, keeping up its sinking funds, paying taxes, rents and interest on loans. These charges being provided for, the government reserved an emergency right to make deductions from the remaining compensation to satisfy indebtedness to it.

Such power was to be used only when no other means was available, and when its exercise would not interrupt unnecessarily the regular payment of dividends, where such dividends had been disbursed during the test period. Finally, the contract specifically stated that none of its provisions should be construed as expressing or prejudicing the future policy of the United States concerning railroad ownership, control or regulation.

Protracted negotiations took place before the railroads finally accepted the clauses relative to the right of the government to restore deferred maintenance, and to use a part of the carrier's compensation to pay its debt to the government. But the most insistent contention of the carriers, which was finally denied, was the right to litigation at the end of federal control on the question whether they had suffered damage by reason of diversion of business. It was held by the Director General upon advice of the Solicitor General, that the roads having been taken over for war purposes, Congress intended that the authorized compensation should cover this element.

The "standard return," based upon the average operating income of the three fiscal years previous to 1918, undoubtedly worked injustice to individual roads. For example, the roads of the Southeast, which had been slowly building up their earning capacity, had not in these three years realized fully the results of their investment policy. Yet on the whole, the bargain was probably as fair a one as could have been drawn up for the railroads in general. Nineteen-fifteen was as lean a year as 1917 was a fat one, and the three years when averaged together roughly approximated a just return. And when all the conditions are taken into account, particularly the financial situation that the railroads faced at the beginning of 1918, the transfer of the railroads to the

government must be regarded as distinctly favorable to the interests of railroad stockholders. There is little doubt that the government by this act saved all but the strongest roads from a condition bordering on insolvency.

The Federal Control Act placed within the class of roads entitled to its benefits all independently owned and operated carriers competing or connecting with the roads that had been placed under federal control by presidential proclamation. These were the so-called "short lines." They were in few instances of any importance to the government for the war emergency, yet their very existence was threatened by a policy of unification which would result in a diversion of their traffic. By Section 14 of the Control Act, the President was empowered to relinquish prior to July 1, 1918, any roads not needed, and thereafter any others by agreement with the carriers. In accordance therewith, on June 29, 1918, there were relinquished from federal control 2161 short-line railroads, including standard railroads, plant facilities, electric lines, and switching and terminal roads. By restoration and further relinquishment under agreement, the net number relinquished stood on January 1, 1919, at 2110.

For the protection of these relinquished roads, the administration has prepared a coöperative contract open to signature at will. Signatories are guaranteed a fair division of joint rates, an equitable allotment of cars, and the right to the use of government purchasing agencies. Moreover, in contrast to the refusal of the government to recognize any claim on the part of the controlled railroads to damages for diversion of their business, the Director General agrees to reimburse these short lines in cash for any revenues on competitive traffic lost during 1918, and guarantees for the future to

deliver such amount of competitive traffic to them as is necessary to insure the quantity carried during the three-year test period. Thus far the contract has been taken advantage of by relatively few of the relinquished roads.

Federal Operation

From the summary already made of the reasons why the roads were taken over, it appears clear that the main object in view by the Federal Railroad Administration [1] was that of making the railroads a part of our line of communications and an effective weapon in the conduct of the war. This meant first, that the transportation system of the country must be operated as a unit and made to serve our war needs, with only secondary regard to other considerations, and second, that in the accomplishment of this task, there should be no waste transportation if it could possibly be avoided. We were seriously short of facilities, and the task could be accomplished only if every mile of track and every unit of equipment were used to their utmost capacity and in the most efficient manner. Yet as we shall see later, the demand for speed and efficiency was not always consistent with the requirements of economical railroading.

Of the many methods inaugurated for securing economies in service, those which brought the largest returns in money, if we may rely upon the estimates of the Administration, have been the elimination of passenger service, the unification of terminals, and the reduction in size and expense of the organizations of the individual railroads.

That there was ample justification for elimination of passenger service as a war measure needs little demon-

[1] For the organization of the United States Railroad Administration, with a summary of its accomplishments for the first seven months, see Brice Clagett, in Quarterly Journal of Economics, vol. xxxiii, p. 188, November, 1918.

stration. Even before the war, there was much comment concerning duplicate passenger service out of the large cities, particularly those of the Middle West, like Chicago, St. Louis, and St. Paul, and now when every available locomotive and car was needed either for the handling of food or munitions, or in transporting troops to the camps and the embarkation points, and when track room at the inadequate terminals was at a premium, the Administration was well within its rights in introducing somewhat ruthlessly a severe cut in service. The saving appears to have been the largest in the west and northwest, where passenger accommodations had been the most liberal, and in the Eastern Region where the traffic was heaviest. The method followed was to eliminate duplicate service, and in many cases to lengthen the schedules of limited trains and impose upon them the duty of handling local traffic. The hours of trains on parallel routes were " staggered " and railroad tickets were honored by alternative routes. Some trains with light earnings were discontinued altogether. In the case of transcontinental traffic, the fastest service was assigned to the most direct route, the others being used for local traffic. The Director General estimated the annual saving in passenger train miles as 67,291,000, or a little over 10 per cent. Some of the Regional Directors have computed the saving at $1.00 per mile.

This reduction in scheduled train service made possible a notable achievement of the Administration in its troop movement, in which from January 1, 1918, to the signing of the armistice, there were transported 6,496,150 men. From 4500 different points, 1,785,342 drafted men were moved to training camps and fed in transit. Of the total movement, 4,038,918 men in 9109 special trains traveled an average distance of 855 miles, the largest long distance troop movement in history. Into

the crowded embarkation ports were brought 1,904,014 men without interference with other traffic. During one period of 30 days, more than 20 troop trains daily entered the port of New York.

That the policy of reduction of passenger service has resulted in very appreciable inconvenience and discomfort to the traveling public, every one can testify, but it was borne with cheerfulness as a war necessity, and for that reason only. That the Administration fully appreciates this fact is evident in the generous restoration of pre-war service that has already taken place. To what extent the roads can or will eliminate the waste of passenger transportation when they are again in possession of their properties remains to be seen. Many executives have contended that the wasteful duplicate service is the result of an inability to agree upon a more efficient schedule of operation, without incurring the penalties of the Anti-trust Act. Whether or not this is true, there is a vast difference between the ability to do a thing, and the desire to do it. The removal of any possible restrictions of law would not compel railroads to arrange their trains on an alternating schedule, or to assign to some one road the limited service and leave to the others the local service. The desire of each road to offer the best service at the most popular hour of the day is the cause of transportation waste, and the removal of legal restrictions with an opportunity to pool earnings, would not provide compensation for a loss of the advertising value of good train service, nor could it eradicate the natural and commendable spirit of emulation.

In the unification of terminal facilities, the opportunities for radical economies are not so abundant as in the reduction of passenger service. While many of the competitive practices have been done away with, the physi-

cal barriers to a thoro unification cannot be removed. The growth in population and the increase in land values has intensified a situation which was essentially uneconomic and unscientific from the beginning, and which is due to the competitive and individualistic character of our railroad development. On the side of passenger service, the most striking case of unification is found in the opening of the Pennsylvania Terminal in New York to the Baltimore and Ohio and the Lehigh Valley railroads.

For the control of freight traffic, terminal managers were appointed at all the important terminal points. While the actual physical reconstruction of terminals was of course impossible, there was opportunity for saving in switching costs and consequently increased speed in handling. Efforts have been made to route traffic so as to ensure delivery with the minimum of switching, and when switching has been required, to confine the service to as few carriers as possible. It was found for example, that in some cases in the Chicago terminal, as many as nineteen different railroads were serving one plant or district solely as a result of competition. Wherever possible, switching is now confined to one line. In the Southwestern Region, the switching work formerly done by 109 roads is now handled by 54.

The weakest point in our present operating machine is found in the state of the terminal facilities, a condition growing rapidly more serious with the increase in population and the lack of available space. It is a comparatively simple problem to increase trackage on the line, but the benefit of such increase is altogether neutralized if cars cannot be handled expeditiously at terminals. As a matter of fact, it may happen that additional business results in an actual loss to the carrier accepting it, because it slows up its entire service, and often only

serves to create congestion and stagnation. It has been the primary object of the carrier to meet the wishes of the shipper, to provide him with equipment promptly as called for, and to accept his consignments without question. In fact, this is the obligation imposed upon the carrier by law, and while there is likewise imposed the legal obligation to deliver, yet the accent both in legislation and in practice has been placed upon the act of getting goods started on their way, regardless of the capacity of the terminal to take care of the cars or of the consignee to unload. The only relief heretofore has been the resort by terminal roads to the crude and unsatisfactory method of embargoes, which have simply forced the congestion back along the line, and have produced wave-like movements of traffic, difficult to handle and creating conditions unsatisfactory to shippers. Under federal operation the so-called "permit system" was introduced for certain kinds of traffic, especially that essential to the war, under which goods could not be accepted for transportation until assurance was received that the consignee could accept and unload without car delay. This system, in the management of which all government departments coöperated, alone made possible the handling of the immense war traffic without congestion. All War and Navy Department shipments were handled on a permit basis. All export traffic via Atlantic, Gulf, and Pacific ports was and is still handled in this manner, and the system was applied during the war to domestic shipments to Philadelphia, New York, and Baltimore. Wheat and hog shipments to primary markets have been stabilized by this process. Except for export shipments and the handling of grain, there is at present no further need for the holding back of traffic, but the success of the experiment has been so decided that it should be carried over into normal times to be

applied in periods of emergency. What embargoes have not been able to accomplish, might be secured through a bureau of the commission such as the Car Service Bureau, charged with the duty of watching congested terminals, and exercising a control over traffic that would assure a more steady flow, and when necessary, divert traffic through gateways that were better prepared to handle it. In connection with the solution of this problem, the Railroad Administration also undertook the coördination of the marine departments of the different railroads and the use of all piers regardless of ownership. A much more ambitious project was the creation of the Exports Control Committee, with power to determine the ports to which traffic should be hauled, thus overcoming the utter lack of coördination between rail and water agencies that prevailed at the beginning. The permit system was employed to prevent the shipment of goods to any port until there was a practical certainty that ships would be promptly available.

The war did not last long enough to give this committee the opportunity to make its influence felt in any large way on the traffic of the country. But some means must soon be found to put this policy into practical operation if we are to utilize to the best advantage our railroad, port, and steamship facilities, and avoid the frequent congestions and blockades that arise from a too great popularity of a relatively few of our ocean terminals. Shipping must be attracted to the less frequented ports, and traffic must be so distributed that a steady flow to and from the ports can be assured the railroads serving them. This will raise the question whether it is to the public interest to permit the continuance of the railroad control of terminal facilities, under which close traffic agreements are made with steamship lines, frequently to the detriment of the proper development of the port.

We shall have no thorogoing solution of the ocean terminal problem until the public recognizes its right and its duty to own and control the facilities in the interest of the public as a whole.

In the reduction of costs of operation and the improvement of service, the greatest opportunities for the future center in the problem of terminals. The public has permitted these properties to develop without, until recently, taking any serious interest in their character and location, and large cities have been provided with separate and scattered terminal yards constructed on the theory that each railroad is an isolated undertaking having no relation to any other. The result is that consolidation of terminal properties becomes today a well-nigh insoluble problem because of its physical difficulties and its financial magnitude. The claim that any movement toward joint terminals would be illegal under the Antitrust Act has no basis in court decision, beyond the ruling that such terminals must not be organized with the purpose of preventing competition.[1] Whether the very moderate movement in the direction of unification inaugurated by the Railroad Administration will be carried over and further developed, depends to a considerable degree upon the plan finally adopted for the future operation of the railroads. The public should certainly not allow this promising beginning to lapse.

By the reduction of the operating organizations, and the elimination of two or three hundred officers at salaries of $5000 or over, Director General McAdoo estimated that he had accomplished an annual saving of about $4,600,000. But this " saving," widely heralded in the newspapers because it meant the elimination of the exorbitant salaries paid to railroad executives, was largely a matter of bookkeeping. The greater part

[1] United States v. Terminal R. R. Association of St. Louis. 224 U. S. 383.

of the officers released by the Administration continued as officers of the railroad corporations, and the sum total of administrative expense remained as before. Moreover, the Director General recognized the necessity of paying salaries of $40,000 and $50,000 to his Regional Directors. Other members of his staff whom he secured at lower salaries, assumed their duties as a war service and at a considerable personal sacrifice. When in addition to this, it is observed that the expenses of the federal administration are steadily growing, it must be concluded that this is one of the instances in which the desire of the Administration to do the popular thing, led it into promises that it was unable to fulfill.

In contrast with the British plan, leaving the operation of the roads to their General Managers under a government guarantee, the Director General inaugurated a régime of federal operation, with a staff which, altho made up largely of experienced railroad men, was required to sever all its former connections and recognize responsibility to him alone. Basing his action upon the Biblical generalization that " no man can serve two masters," he made a definite cleavage between the operating staff and employees, which now were placed on the pay-roll of the Federal Railroad Administration, and the officers of the railroad corporations, who represented the owners, stockholders, and creditors as lessors of the railroad property. Many of the former executives have been retained as operating heads of systems or groups of roads, many others have become presidents of their corporations, with the duty of protecting the interests of their stockholders. The explanation of the practice of the Director General, in notable instances, in passing over the presidents of the large railroads, and selecting subordinate officers as his federal managers, seems to have been a feeling that more whole-hearted

subservience to federal authority would be assured in the case of younger men, whose duties had not brought them so closely in touch with broader corporate interests and questions.

The three "economies" in which the largest estimated saving was shown have now been discussed. Other administration policies may be summarized briefly. Rerouting of traffic to avoid unnecessary mileage was attempted in all sections, and it was assisted materially by shippers themselves who, after the disappearance of the traffic forces and the ending of solicitation, naturally sought the shortest routes for their goods. But direct routes, especially in the east, became so congested that roundabout hauls were required, and the saving was thereby largely nullified. No satisfactory estimate of savings can be made, but it is doubtful whether any large economies resulted under the emergency conditions of the war period. The "sailing-day-plan," under which less-than-carload freight is assembled in solid cars and despatched without transfer to destination, has been widely introduced, but not without protests from shippers in some sections, who have felt that their privileges were being curtailed. They have protested against being obliged to bring their traffic to the freight station on designated days only, and to ship it only by designated routes. But many of the objections to the plan as originally promulgated have now been removed, and with its more general introduction its advantages from the standpoint of service are likely to be better understood and appreciated. The movement for better loading of cars and trains, begun and largely accomplished under the Railroads' War Board, has to some degree improved during the period, with the invaluable assistance of the various government agencies concerned. Moreover, the shippers contributed to this

not alone from patriotic motives, but because they felt the necessity of making full use of their limited supply of cars. Solid trains were routed direct from origin to destination, expediting traffic and saving yard expense. The service was applied most extensively to traffic in flour and grain, lumber, fruit, packing-house products, live-stock, cotton, and oil. However, the statistics of loading, particularly for the Eastern Region, are materially affected by the extent of empty car mileage westbound, which the war exigencies forced upon the management. So far as was possible, the "permit system" was used as a weapon to enforce full return loads. The coal-zoning plan, introduced primarily to meet the fuel shortage, was effective in eliminating a large waste in transportation, altho it necessitated a serious readjustment in markets that were accustomed to certain grades of coal, and were by this plan now obliged to resort to substitutes. An increase in demurrage rates almost to a prohibitive point, was put into force to speed up the unloading of cars. Through interline way billing was extended and reconsignment privileges to a considerable degree eliminated. A system of store door delivery of package freight was introduced in New York and Philadelphia to relieve the terminal situation. The Car Service Section undertook with some success the campaign for advance movement of important raw materials during the summer months, to avoid a possible congestion in the fall. Finally, there may be mentioned the devising of methods for the consolidation and simplification of tariffs and the completion of a uniform freight classification, in preparation long before the war, which has been submitted to the Interstate Commerce Commission, but not yet approved.

In the passenger field, the project which is looked upon with the greatest satisfaction by the Administra-

tion is that of the consolidated ticket office. The number of these was 101 at the beginning of the year, replacing 564 offices previously in existence. It is insisted that the convenience to travellers in the combination of Pullman and ticket offices, and in the opportunity to decide between alternative routes with a minimum of inconvenience, provides a service that the public will demand as a permanent feature. But whether it will persist or not depends altogether upon the extent to which the principle of coöperation among railroads is continued. That consolidated ticket offices can be maintained as at present under a régime of competitive service, such as existed previous to the war, seems very improbable. Whether or not the practice is legal under the Antitrust Act is a matter of dispute among railroad men. In the Union Pacific — Southern Pacific merger case, the prosecuting officers attached much importance to the consolidation of ticket offices as infractions of the law, and after dissolution all consolidated offices were abandoned. Other unification policies in passenger service include the introduction of a universal mileage book, standard ticket forms and baggage rules, and the general practice of abridgment of time-tables and curtailment of advertising. Attempts to standardize dining-car service struck at the very source of individualism, the human stomach, and the results have not been altogether successful. To promote uniformity in operation, there was created in May an Operating Statistics Section with W. J. Cunningham in charge, which was to do for operation what the Interstate Commerce Commission has done for accounting. It was to decide upon operating statistical standards and make them effective, and to analyze and disseminate operating results. Its plan for the standardization of statistical practice was made effective on August 1, 1918, and

its work has developed with such efficiency that its standards and reports are likely to have a permanent place in railroad administration.

In the field of maintenance, many practices have been standardized, and the principles of unification introduced. Locomotive repair shops have been pooled regardless of ownership, thus reducing distance to which locomotives are sent for repairs and the time they are out of service; standard practice has been introduced in many phases of maintenance and inspection, and the policy of inspection has been extended to take the place of commercial insurance, now abolished. Joint purchase of supplies has been undertaken wherever possible. The most sweeping innovation and the one which has met with the strongest opposition, is the introduction of standardization into the manufacture of locomotives and cars. The Director General, in his seven months' report of September, 1918, stated that there were said to be prior to the war 2023 different styles of freight cars, and almost as many of locomotives. At the time of his report, twelve standard types of freight cars had been decided upon, and six types of locomotives in two weights. With interchangeable parts, it was expected that these relatively few types could be more rapidly repaired, particularly when off their own lines, and that the stock of repair parts could be reduced. Moreover, it had already been demonstrated that the speed in production of new equipment was materially increased. Aside from the natural opposition of the locomotive and car builders to this policy, there are many expert railroad maintenance engineers who feel that the policy of standardization has been carried too far, and that many roads are consequently unable to secure the equipment adapted to their peculiar needs. Efficiency in operation has been

sacrificed to efficiency in production. Probably the reasonable policy lies somewhere between the two extremes. While experimentation should be sufficiently encouraged to assure a steady development in efficiency of equipment types, and the railroads should be free to order those types that are best suited to their needs, the public should not be asked to bear the burden of all the variations from standard that the ingenuity of builders can devise, and induce the railroads to purchase. So far as maintenance work is concerned, the record of the administration is not satisfactory, but it has had to contend with inefficient and inadequate labor and a shortage of materials. The amount of deferred maintenance that has piled up on the railroads during the past eighteen months is a matter of grave concern to the owners of the properties.

Two other steps involving far-reaching consequences in the direction of unification have been taken, those relating to the express companies and to the waterways. With the express companies, each railroad had a separate contract, and these contracts varied widely in their stipulations concerning the handling of different kinds of traffic. There was necessity for a uniform contract applicable over the entire railroad net. Accordingly, a corporation known as the American Railway Express Company was created to take over the existing companies during the period of federal control. With this new corporation the Railroad Administration made a contract, under which the express company was to pay to it 50¼ per cent of its gross revenue from transportation of express matter, which was the average payment under the contracts of the previous three years. The balance after deducting operating expenses was subject to a division between the company and the administration. In November, the control and opera-

tion of the company was taken over by the Railroad Administration under presidential proclamation. Express matter is now sent by the most direct route available, and express cars are utilized independently of ownership.

By the Federal Control Act, the President was authorized to expend from the revolving fund what he deemed necessary or desirable for the utilization and operation of canals, and the purchase, or construction and operation of equipment on inland and coastwise waterways. A Marine Department was created under the Railroad Administration. Because of the requisitioning by the government of a large amount of coastwise tonnage for war purposes, the remaining private lines were disposed to accept only the most profitable tonnage, and an additional burden was in consequence thrown on the railroads. Accordingly, the Railroad Administration not only took over all railroad owned steamships, but also under the President's war powers, fifty-one ships belonging to four private companies. These private vessels were returned to their owners after the armistice. In April, 1918, the New York Barge Canal Section was created, and the leasing and construction of equipment was undertaken. But the terminals were not yet constructed and equipment was inadequate throughout the season, so that nothing was accomplished. In July, the Cape Cod Canal was taken over to provide an inside waterway free from submarine danger. Dredging and other maintenance work was at once undertaken, and traffic began moving in volume in the fall. In the same month, the Mississippi and Warrior Waterways Section was created. The fleet of the Kansas City-Missouri River Navigation Company was purchased, and barges were leased from the Corps of United States Engineers. Construction of towboats

and barges was authorized. Traffic on the Mississippi has thus far been confined to that which originates along its banks, but joint rail and water tariffs are to be issued that will show a differential of 20 per cent in favor of the water route between St. Louis and New Orleans. For the coal business between the Warrior River, Alabama, and New Orleans, equipment has been purchased and additional construction authorized. The Delaware and Raritan Canal is being operated by the administration, which is also guaranteeing the Chesapeake and Ohio Canal against loss. Thus far coöperation between rail and water transportation under federal management has been a hope rather than an accomplishment, and this is not the place to discuss the general problem of coöperation. Suffice it to say that so far as such a policy of the Railroad Administration contemplates the utilization of natural waterways, in which the burden of construction and maintenance cost is relatively small, it is to be hoped that the program will be pushed with vigor, and that a real foundation will be laid for a policy of efficient coöperation under private operation. Incentive has heretofore been wholly lacking. It will be lacking again if railroads return to their earlier competitive status. But if coöperation is to prevail at all in the future, the more efficient waterways should be a part of the program.

It will be seen from this summary that the policies of the Railroad Administration may broadly be divided into those that aimed to contribute directly to the war demand, by freeing equipment and right of way for the movement of troops and essential commodities, and those which aimed to meet the steadily rising costs of operation by economies of various sorts. Many of these latter attempts failed, during the war period, to produce the expected results, but the purpose has been clear —

to operate with the greatest possible economy consistent with war's demands. Of course this policy has not been carried out without dissatisfaction to passengers and shippers, and now that the seal of silence imposed by patriotism is broken, we are learning very definitely the public's opinion of government operation. Many of the changes introduced have long been needed, but were impossible of accomplishment under competitive conditions. Should coöperation on a large scale follow this period of federal operation, the lessons learned in the experiment with policies of unification should not be lost.

Labor Conditions

No more serious situation confronted the railroads in December 1917 than that arising from their relations with their employees. A drain of the working forces had begun at the opening of the war, with the allurements of higher wages in other industries, and many of the carriers had been turning their mechanical forces over two or three times in the year. The draft and the call for railroad men to serve in the war zone had further depleted them. The steadily rising costs of living, with too great deliberation on the part of many roads in facing the situation, created a spirit of unrest, broke down the old forms of negotiation, and necessitated adjustments overnight to avoid a stalling of the transportation machine.

One of the first general orders of the Director General created a Railroad Wage Commission, under instructions to make a broad general investigation that should include the relation of railroad wages to those in other industries and the relation of different classes of labor to each other, the wage conditions in different parts of the country, the immediate emergency of the war and the high cost of living. The recommendations of this Com-

mission for immediate relief were based upon an investigation of the increase in living costs since December, 1915, and recommended increases for all employees receiving less than $250 per month, graded from an increase of 43 per cent for all receiving $50 per month and not less than $46 (under $46 a flat increase of $20), down to an increase of $1.00 for those receiving above $248 and not more than $249 per month. These increases were applied to the rates in effect December 31, 1915, and were to be diminished by the amount of any increase received since that time. Reductions in hours were not to be regarded as increases in pay. Existing hours of service and existing rules and conditions of payment were not to be disturbed during the war period. It was pointed out that 80 per cent of the employees were receiving $100 per month or less, and that the number receiving from $150 to $250 per month included less than 3 per cent (excluding officers).

In General Order No. 27 which embodied these recommendations, some additional increases by way of the establishment of minima were granted to the shop crafts and to common labor, but the most significant departure from the conclusions of the Commission was the recognition of the principle of the " basic " eight-hour day in all railroad employment. Overtime was to be paid pro rata unless existing agreements provided otherwise. Where women were employed, suitable working conditions were to be provided and their pay was to be the same as that of men for the same class of work. An advisory Board of Railroad Wages and Working Conditions was set up to hear and investigate matters relating to inequalities in pay and regulations, which was to report to the Director General.

This general increase proved unsatisfactory to many classes, particularly those that had already received in-

creases since December, 1915, and furnished only the beginning of a succession of increases for various classes, including shop employees, clerks, telegraphers, employees in express and Pullman service and finally the four brotherhoods, who received an annual increase of over $60,000,000 in April, 1919. The Board of Wages and Working Conditions has made the announcement — comforting to the railroad managements — that these increases, while generally less than those granted for similar work outside, have been established with the object in mind of creating a wage structure that would survive the war period. The cycle, now officially declared to be complete, is estimated to mean an addition to operating expenses during 1919 of $900,000,000, which is nearly 20 per cent of the total operating revenues for 1918.

But the size of the wage bill is not the most significant change in the situation. Rather does it lie in the development of the policy of standardization. In addition to the Board of Railroad Wages and Working Conditions set up to investigate the larger questions of policy and compensation, there were created bipartisan boards of adjustment with equal representation of employers and employees, to which, under a signed agreement with the unions, controversies were to be referred growing out of the interpretation of wage schedules, that could not be adjusted between the employees and officials of the individual railroads. For the adjustment of controversies among the unorganized employees, an official was appointed under the Division of Labor of the Railroad Administration. As a consequence of this centralization of wage adjustment, there has been developing a uniformity in practice not before prevailing on the railroads of the country. The announcement of the Director General in February, 1918 that no discrimina-

tion would be made in employment because of membership or non-membership in labor organizations, resulted, so he stated, in a declaration from the organized employees that they did not contend for the closed shop as against non-union members, and in the organization of employees into unions on roads that had previously forbidden organization.

As already stated, the Director General formally established the basic eight-hour day.[1] Supplementary orders have done much to make this a real eight-hour day by increasing the number of men to whom time and a half for overtime applies after eight hours, and in the case of other classes, extending the practice of paying time and a half for overtime to all hours after the ninth and tenth. Similarly standard working rules have been established for more than a million employees that had not theretofore worked under fixed regulations. If the roads continue for any considerable time under federal control, it is a safe prophecy that standardized rates, time and regulations will be established permanently throughout the country. That the present organization is working to the general advantage of labor, in spite of the many grumblings, is evident from the action of the four brotherhoods, the barometer of railroad employee sentiment, in proposing a plan for permanent nationalization. This sudden overturn in their established policy is not an altruistic move, but is rather a shrewd estimate as to what federal management means to them.

On the question of the loyalty and efficiency with which labor has worked during the period of federal operation, an answer is well-nigh impossible, because of the amount of dilution incident to the war. That the

[1] Shop crafts waived their rights to limited hours during the war. Many shops worked seventy hours per week and the remainder sixty hours, as a result of the bad condition of locomotives and the shortage of labor. Labor received time and a half for overtime. After the armistice, the eight-hour day was restored.

patriotic stimulus kept the forces, such as they were, up to their maximum effort for the better part of last year is probable. Under the uncertain conditions of the present, when officials and employees are in doubt whether their future employer is to be the United States government or their former executive returned from his period of banishment, there is likely to be a stage of lowered morale and lessened efficiency.

Rate Increases

Finding itself facing the possibility of a huge deficit, primarily as a consequence of wage increases and the increase in cost of materials and supplies, the Administration took advantage of the powers granted in the Federal Control Act, and announced on May 25, 1918, a 25 per cent advance in freight rates effective June 25, and an advance in passenger fares to a minimum of three cents per mile, effective June 10, with a half cent additional per mile for the privilege of purchasing Pullman service.[1] Additional regulations concerning Pullman travel still further increased the cost for those seeking the more luxurious accommodations. The new rates were made specifically to apply to both state and interstate traffic. In many cases, due to changes in minima and in the methods of application, the increases in freight rates were much in excess of 25 per cent.

The method by which the increase was accomplished must have won the envy of all railroad officials, who had struggled through protracted hearings with Federal and State Commissioners, and had been obliged in the end to accept increases, if any at all, far below what they deemed necessary to meet their needs. The Director General explained that action was necessarily delayed

[1] This extra charge has been cancelled since the armistice.

until the Federal Control Act could be passed; that the correction and adjustment of individual items in a structure so vast would have been impossible in any brief space of time, and that after conference with the Commission, and after investigation of existing conditions and a careful estimate of probable results, it was decided to take quick action that would spread the increase as equitably as possible over the entire country. While the Administration doubtless gave the matter mature consideration, the public was not taken into its confidence and had to content itself with newspaper rumors. There is little question that the summary manner in which the increases were put through was deliberate, and designed to forestall any interference that might spring from public discussion. In fact, such a procedure was specifically provided for in the Federal Control Act itself, which reduced the power of the Commission from that of suspension of rates to that of hearing complaints concerning rates actually in effect.

These increases were intended so to enhance net operating revenue that the " standard return " payable to the carriers under their contracts could be secured without drawing upon other government funds. But obviously such a purpose could be based on estimates only, as it was impossible to foretell what the effect upon traffic would be from the increases in rates. So far as passenger traffic was concerned, the deliberate intention of the high charges was to reduce travel, and to free roads and equipment for more important functions — a purpose that largely failed of effect.

As for freight traffic, there was some prospect that the higher rates would be more or less directly reflected in higher net earnings, for transportation demand, in view of war emergency conditions, was largely inelastic, essential commodities having to move regardless of cost.

But the results of the year in no sense fulfilled these optimistic predictions. For the twelve months, the net railroad revenue fell short of the amount required to meet the "standard return" by over $202,000,000. The only district that earned its standard return was the Southern District, comprising the states east of the Mississippi and south of the Ohio and Potomac. The result in the South is attributed to the recent improvement in the physical condition of the southern roads and the large number of camps in that section, but principally to the fact that the years upon which the contract was based were years of light earnings. Their bargain with the government was consequently an unfortunate one.

The reasons assigned by the Director General for the outcome, in which the operating ratio had risen to 81.3 per cent, are all connected directly or indirectly with war conditions — the necessity of moving war freight expeditiously regardless of expense, the loss of men to the draft and to railroad service abroad and the substitution of inexperienced labor, and the rapid increase in cost of labor and materials. Moreover, while wage increases were largely effective from January 1, the railroads received the benefit of rate increases for only the last six months of the year. This deficit, says the Director General, should be frankly charged as war cost and should be considered an exceedingly small expenditure for the result accomplished.

As late as January, 1919, Director General McAdoo expressed the conviction that with the return to more nearly normal conditions the deficit would not only be wiped out, but reductions in rates might gradually be made; and that earnings would show an improvement for each month over the previous year. Yet the reports for the first three months of 1919 do not bear out this

prophecy. The net deficit below the standard return for the first quarter of 1919 amounted to $176,000,000, which is nearly $30,000,000 greater than for the corresponding period of 1918. While operating expenses were considerably greater than a year ago, the operating ratio being 91¾ per cent, the significant factor, particularly in March, was the decline in traffic, which was reflected in a figure of gross revenue only slightly larger than for 1918 in spite of the increase in rates. Whether any further relief is to be found in the development of operating economies remains to be seen. But it seems probable that a genuine revival of peace time industry will be necessary to turn the scale. The Administration is face to face with that fundamental law, so dominant in the railroad industry, that a loss in business cannot be offset by a corresponding reduction in costs. If on the other hand, a substantial increase in business takes place during the year, it should be reflected in a considerable increase of net revenue.

Capital Expenditures and the Revolving Fund

By the Railroad Control Act, a sum of $500,000,000 was appropriated, which together with any funds available from the carriers in excess of the standard return, was to be used as a revolving fund to pay the expenses of federal control, to cover deficits in the standard return, if any, and to provide terminals, motive power and cars. From this fund the President was authorized to make advances to carriers for any part of such additions, betterments and extensions as he had ordered, such advances to be charged against the carrier, and to bear interest. He might also use this fund to promote the operation of canals and inland waterways by the

purchase of equipment or otherwise. From this fund the President was also authorized to purchase for the United States at not exceeding par any securities issued by the carriers, that had been first approved as consistent with the public interest.

During the year 1918 there was authorized for improvement by the Director General through the Division of Capital Expenditures, the amount of $1,279,000,000, of which $573,000,000 was for additions and betterments, $659,000,000 for equipment and $47,000,000 for extensions, branches and other lines. Aside from those appropriations made directly for war purposes, approval was confined to such expenditures as were necessary for safety in operation, or to provide a needed increased capacity, and any expenditure not required for these purposes was in most cases deferred.

The policy was laid down by the Administration of authorizing improvements to effect permanent economies, only when the economy was so great that the cost could probably be saved during the period of federal control. Hence the large items of expenditures were additional main tracks, yard tracks, and sidings, shop buildings, engine houses and appurtenances, and locomotives and cars. Director General Hines, Mr. McAdoo's successor, in submitting to the Secretary of the Treasury in January, 1919, a supplementary estimate for an addition to the revolving fund of $750,000,000, showed that the Railroad Administration had expended for additions and betterments actually made during the year 1918, in excess of the amounts which the companies could repay from their rentals, the sum of $291,000,000. In addition to this, $51,475,000 had been loaned to the New York, New Haven & Hartford, $4,360,000 had been expended for inland waterways, and the Administration was facing an operating deficit estimated at that time at

$196,000,000, since found to be $202,000,000. There were on hand cash and net current assets tied up as working cash capital, $339,000,000. The Director General stated that during 1919, financial provision must be found to finance inland waterway expenditures of $12,340,000; to aid in financing the reorganization of the Boston and Maine, $20,000,000; to finance equipment to be delivered during the year, $286,000,000; and to finance other necessary capital expenditures, $491,000,000. He estimated that $150,000,000 could be derived from company rentals to be devoted to capital expenditures. It should be recalled that all this projected expenditure will be reimbursed to the government with interest with the exception of the operating deficit, which is a direct war cost. The failure of Congress to pass the requested appropriation created a critical situation, which was met by temporary financial expedients, in which the banking community came to the rescue.[1]

Relation of the Railroad Administration to Existing Regulating Agencies

In his proclamation taking possession of the roads, the President directed that the systems of transportation taken over should remain subject for the time being to all statutes and orders of the Interstate Commerce Commission and the state commissions, but that any orders thereafter made by the Director General should have paramount authority.

Such sweeping authority as was assumed by the President under his war powers and as was further specifically delegated to him by the Federal Control Act in March, 1918, could not but run foul of existing regu-

[1] With the reassembling of Congress in May, Director General Hines increased the amount of his request from $750,000,000 to $1,200,000,000.

lating bodies. The very first order of the Director General, dated December 29, 1917, authorized the carriers to disregard established routes whenever necessary in the interest of economy and efficiency, and thereby superseded Section 15 of the Interstate Commerce Act, which protects carriers against being short-hauled, and which grants to shippers the right to route their freight. By throwing all railroads into one operating system and authorizing the utilization of all terminals, equipment, and facilities regardless of ownership, this same General Order removed the protection granted by Section 3, which gives to carriers exclusive right to use their own tracks and terminals. But in the matter of rates, the limitations upon the Commission's authority were particularly severe. The Federal Control Act (Section 10) provides that whenever the public interest requires, the President may initiate rates, fares, charges, classifications, regulations and practices by filing them with the Commission, and that these rates and regulations cannot be suspended by the Commission pending their final determination. They are to take effect upon such notice as the President shall direct. When they are once in effect, the Commission may upon complaint, enter upon hearings and render decisions as to their reasonableness and justice. But the Commission is instructed by law to give due consideration to the fact that the transportation systems are not in competition, but are being operated as a unit. Moreover, whenever the President finds and certifies that in order to defray the expenses of federal operation and cover the compensation to the carriers, it is necessary to increase revenues, the Commission is required in passing upon such increased rates, to take into account the finding and certificate of the President, together with such recommendations as he may make.

This rate-making power of the President supersedes Section 6 of the act, which requires thirty days' notice of a change in rates; it takes away the power under Section 15 to suspend rates, and makes it unnecessary for the carriers to secure advance authority from the Commission to increase rates. While the Commission, within the restrictions stated, is unhampered in rendering decisions upon specific complaints after hearing, and has decided cases continuously during the past year with the Director General as defendant, many of which went against the Railroad Administration, yet its power has unquestionably been reduced in actions involving an entire schedule of rates, when the fundamental question at issue is one of adequate revenue. The findings and certificate of the Director General have, by the specific requirements of law, a weight that leaves the Commission little choice except to approve the schedule in effect. Such issues as have given opportunity to the Commission to assert its remnant of independence may be illustrated by the case of Willamette Valley Lumbermen's Association *v.* Southern Pacific Company (51 I. C. C. 250) in which the rates were complained of as unreasonable and unduly preferential of other shippers and localities. It was the argument of the Director General that the words "reasonable and just" in the Control Act have a meaning different from that applied to them in the Act to Regulate Commerce, and that the rates initiated by the Director General are in themselves and in relation to each other presumed to be right, and cannot be changed without an affirmative showing that they are wrong. The first contention the commission denied. To the second, they replied that there was no authority in the Control Act for perpetuating during federal control a rate adjustment that was unlawful under the Act to

Regulate Commerce; that the increases initiated by the Director General were merely superimposed on the existing basis of rate adjustment, which all the evidence shows was unreasonable and unjust. "It is inconceivable," said the Commission, "that the Congress did a vain thing in conferring upon the Commission power to determine whether or not the rates initiated by the Director General are just and reasonable." An appropriate order was entered against the defendants, including the Director General.

So far as rates not under federal control are concerned, they are subject in all their interstate relations to the Act to Regulate Commerce, and the commission still has its former jurisdiction over joint traffic between federal and non-federal roads. But this jurisdiction covers a relatively insignificant portion of the traffic of the country.

In the field of authority occupied by the state commission, the Federal Railroad Administration has shown even less regard for the sensibilities of regulating authority. General Order No. 28, increasing freight and passenger rates, was made specifically applicable to intrastate as well as interstate traffic. In matters of service, the Railroad Administration proceeded with almost no recognition of even the existence of state commissions. Relations became strained as a result of the creation by the Federal Administration of regional and district traffic committees. These committees, composed of representatives of the Administration and of the business interests, were set up after the schedule of increased rates had gone into effect, and were designed to promote efficiency and expedition in the handling of adjustments in rates and regulations. It became the practice of many railroad officials to disregard the jurisdiction of the state railroad commissions

and take up rate matters directly with these traffic committees. These committees have held no formal hearings, but have reported their findings through the regional committees to the Director of Traffic at Washington, who alone has power to render final decision. The shippers have frequently insisted that this has deprived them of their day in court, and that the rulings have not adequately taken into account local conditions and interests. On the other hand, Mr. Prouty, as Director of the Division of Public Service and Accounting, has declared that in all his experience with rate-making, extending over nearly a quarter of a century, there has never been a time when rate changes have been made so intelligently and so speedily as now, and that the practice of having shippers participate in preliminary discussions will in some form be perpetuated. Local feeling became articulate in resolutions adopted at the meeting of the National Association of Railway and Utilities Commissioners in October, 1918, in which the members demanded full authority on the part of the states and declared that in any event it was the duty of each state commission to exercise and maintain its authority to the extent which it might deem the public interest demanded. It declared further that "the Association is emphatically of the opinion that any plan for the future operation of the railroads should fully safeguard the powers of local tribunals, responsible to the people of the several states, with respect to rates, service and facilities intrastate in character."

During the war, the Federal Railroad Administration never squarely met the issue and never officially interpreted its powers. In practice, it initiated state rates and filed them with the state commissions "for information only." In matters of service, it asserted its complete authority. In January, 1919, the war having

ended, and plans being under way for returning to a peace basis, Director General Hines appointed as Director of the newly created Division of Public Service, Max Thelen, formerly Chairman of the California Railroad Commission, one of whose duties was to establish a helpful understanding with the state commissions. In February, after conference with representatives of the state commissions, the Railroad Administration announced its policy. Transportation systems under federal control were to continue subject to the lawful police regulations of the several states in matters relating to spur tracks, railroad crossings, safety appliances, train service, and the like, and it was to be the policy of the Director General to cause the orders of the state commissions to be carried out. Attention was called, however, to the financial condition of the roads, and it was assumed that expenditures would be ordered by the state commissions only after full consideration of the needs and difficulties of the United States in operating the railroads.

As for rate matters, the Directors of Traffic and Public Service were ordered, before authorizing important advances in rates, state or interstate, to submit them for advice and suggestion to the commissions in the states affected. Carriers were ordered, for the purpose of maintaining the continuity of state records, to file with state commissions, for information only, all rate schedules and annual and other reports required by state statutes. As to the division of authority over rates, the conference disagreed, and the Director General announced his purpose to expedite a decision at law by the appropriate tribunal. A case is now pending in the United States Supreme Court, on appeal from a decision of the Supreme Court of North Dakota, in which the latter court directed the issuance of a peremptory writ

of mandamus, ordering the railroads to desist from collecting on intrastate business any other charges than those on file with the State Board of Railroad Commissioners.[1]

The Future

To treat adequately all considerations underlying the future railroad policy of the country would transgress the limits of this paper. Nor would it be profitable, with new "solutions" of the problem appearing almost daily, to attempt an exhaustive analysis of the various reconstruction projects. It will be sufficient for the purposes of this article to sketch in outline those proposals that are the most significant either by reason of their inherent character, or of the position occupied by their endorsers, and to lay down some fundamental principles which, in the opinion of the author, should be embodied in any plan for permanent railroad control.

Of the various possibilities for the future, the first that comes to mind is permanent government ownership and operation. No plan embodying such a proposal has yet been promulgated. The nearest approach to it is the project of the railroad employees, which is government ownership with private operation. This scheme, presented to the Senate Committee on Interstate Commerce by Mr. Garrettson, and his attorney, in behalf of the four railroad brotherhoods and ten other railroad organizations affiliated with the American Federation of Labor, provides for the acquisition of the roads by the federal government upon the basis of a fair valuation, and the creation of a federal operating corporation, the stock of which is to be held in trust for the employees, official, and non-official. This corporation is required

[1] On June 2, the Supreme Court by unanimous decision overruled the decree of the North Dakota court, and sustained the war powers of the President.

to meet all costs of operation, and the net revenue is to be divided equally between the government and the corporation. The government's share is to be used for the retirement of capital, except that when this share reaches a fixed percentage of the gross revenues, the rates are to be reduced. The corporation's share is to be distributed as a dividend to the employees. The Interstate Commerce Commission is to retain its existing powers, and wage boards for the settlement of disputes are to be created, consisting equally of operating officials and employees. This plan has aroused relatively little public discussion, doubtless because it is difficult to consider seriously a scheme so obviously devised in the interest of a class. Until recently the brotherhoods have been officially opposed to government ownership; in fact, the chiefs of three of the brotherhoods are still opposed to it on general principles. But beginning with the passage of the Adamson Act in 1916, they have found Washington an increasing source of comfort and consolation, and the increases in wages during federal operation have come with such relative ease, as finally to convince them apparently of the wisdom of a perpetual alliance with the Federal Administration. However, it is by no means clear that this project has the support of the railroad employees as a whole, or even of the membership of the organizations signatories to it. In fact, there is evidence in the testimony of Mr. Garrettson that the leaders and their attorney are relying upon a support from the rank and file that has not yet been officially granted. Previous to its introduction, the plan seems not to have been indorsed either by convention or referendum. That railroad employees are not a unit in support of the project is shown by the appearance at the hearings of the president of the Order of Railroad Station Agents to

oppose the Garrettson plan. Certainly until the organizations have come out into the open, and given endorsement to the plan of their astute leaders, there is little ground for the claim made by the more radical labor groups that this project is an evidence of the growing demand of labor for representation in the control of industry.

Besides this halfway proposal for government ownership, there is little organized sentiment in its favor in this country at the present time beyond that expressed by the socialists. No railroad administrator, federal or state has advocated it; in fact, most of them have specifically opposed it. Shipping and commercial organizations in various sections have passed definite resolutions in opposition. The attitude of railroad men and the banking community is self-evident. The universality of this sentiment is striking, and is in contrast with an expression of considerable volume in favor of nationalization a few years ago. This overturn is obviously the result of the period of federal operation.

It was said at the beginning of this paper that the year of federal operation could not be accepted as an argument for or against government ownership, but what was then in mind was a final judgment based upon a careful weighing of all the considerations. The attitude of the American public at present does not rest upon any such painstaking examination of the evidence; it makes no allowances. The numerous hostile resolutions are the composite of many minds and many motives, in some cases expressing opinions designed to accomplish a definite purpose, in others merely registering a thoughtless impatience with an unsatisfactory situation. There is the natural reaction that follows a period of patriotic service and of altruistic endeavor, and an irritation at the deliberation with which adjust-

ments are being made. This attitude of mind is transformed into outright opposition by the inconveniences and annoyances and the deprivation of privileges to which travelers and shippers are still subjected. Shippers have been deprived of many services that they had come to expect as a matter of course under competitive conditions, like the tracing of their freight, assistance in obtaining rate quotations, and privileges in transportation, such as reconsignment. Many of these services might eventually be developed under federal operation; many of them could with difficulty be defended from the public standpoint. Then again, the lack of smoothness of federal operation, much of it inevitable, and the deplorable financial results, have been cleverly played upon by those who fear the extension of government authority, to discredit nationalization. The result is that this plan is definitely postponed and that the country is farther away from it than ever.

But putting to one side the project of government ownership, there still remains the question as to the length of time that war control shall continue. The Federal Control Act provided that government operation should not last longer than twenty-one months from the date of the President's proclamation announcing the exchange of ratifications of the treaty of peace. However, the President might relinquish the railroads at any time that he might deem such action needful or desirable. Director General McAdoo with the approval of the President, presented a proposal for a five-year extension of the present control, a proposal that was later supported with great ability before the Senate Committee by Director General Hines. His general argument was briefly this. The period of the war has been wholly abnormal and the twenty-one months' period is too short in which to reach any sound judgment

as to the merits of unified federal operation. The impending transfer to private control will produce a state of unrest and uncertainty among the working force that will react unfavorably upon operation. The agitation in Congress for a permanent solution, the restlessness of the public in general and the imminence of the presidential election, will all be factors unfavorable to a satisfactory solution within the statutory period. An adequate program of additions and betterments cannot be planned and perfected during this interval, neither can the plans for the creation of economies through unification be fully worked out.

Outside the Federal Administration, this project appears to have met with no favor whatever. An unwillingness to submit in normal times to the character of control that the war necessitated, and which was in many respects arbitrary and autocratic, combined with an impatience to get back to a peace basis, is in part responsible for its cool reception. Then there is the fear partly genuine, that such an extended control would so crystallize the system that its permanence would be inevitable. The railroads have insisted that their financial relations and obligations would become such a serious burden, that they could not again be carried by corporations operating independently, and their goodwill as operating organizations would be destroyed. But however interested some of the arguments in opposition to the five-year extension may appear to be, the burden of proof for the extension of the extraordinary war powers of the President conferred by the Federal Control Act rests wholly upon its advocates, and their arguments have lacked the necessary convincing force.

At the other extreme from this suggestion is that of the immediate return of the roads to their owners. This

alternative was held out by the President in his annual message in December, 1918, as a warning against a failure to find a legislative solution. To this suggestion, the railroads are equally opposed. They insist that if their properties are returned without any plan, or any provision for proper adjustment of relations between them and the government, they will be faced with bankruptcy. They declare that their credit has vanished, and that it is not clear whether they can even collect under private operation the rates now in effect by order of the Director General. Their operating forces have been shaken, if not demoralized, and much time will be needed under their former chiefs for a restoration of their morale. Before transfer takes place, protection must be assured to the roads if the public service is to be maintained. Director General Hines, in reply, has assured the Senate Committee that the Administration, if it should decide to relinquish the roads, would pursue a policy of gradual transition, and would have naturally no other object than to protect railroad property in the interest of the public. Moreover, it is the view of the Interstate Commerce Commission that interstate rates now in force would remain in force until set aside in the usual way. So far as intrastate rates are concerned, while the outcome is not as clear, it seems probable that with a few exceptions, the state commissions would protect existing rates if public interest made it necessary. It seems probable, however, that no hasty return of the roads is to be made, and that Congress will take up for immediate consideration this greatest of our domestic reconstruction problems. It will be of interest therefore, briefly to outline the more important proposals for a restoration of the roads to private hands.

Director General Hines has advocated as a permanent solution of the railroad problem, the creation of a com-

paratively few railroad companies, six to twelve, with capitalization equal only to the real value of the property. This capitalization should have a moderate return guaranteed by the government, which should be sufficient to preserve railroad credit and attract new capital. In excess of this moderate return, earnings should be shared by the government and the railroads, and possibly by labor. The government's interests would be protected by representatives on the boards of directors. Regional commissions coextensive with each railroad system would handle local matters, subject to the final authority of the Interstate Commerce Commission.

The Interstate Commerce Commission has made proposals of a general character looking to an improvement in the situation, most of which are renewals of recommendations made in their annual reports. They include empowering the commission to prescribe minimum as well as maximum rates, removal of the existing limitations upon the power of railroads to coöperate, which would mean the permission to pool earnings and traffic and to agree upon rate schedules; federal regulation of security issues and the emancipation of railroad operation from financial dictation; the expansion of the common use of terminals and equipment; and the establishment of a coöperative relationship between federal and state authority. This last suggestion does not apparently contemplate any legislation for its enforcement, but rather the working out of a plan of harmonious coöperation through voluntary agreement.

The official railroad plan was presented to the Senate Committee by the Association of Railway Executives, representing virtually all the railroad corporations of the country. Their scheme separates the administrative from the judicial functions of regulation. It creates a

Department of Transportation with the Secretary as member of the President's cabinet, to whom the administrative duties are entrusted. He has power to approve or disapprove rates, which are to be initiated by the railroads, and he may suspend them for not to exceed sixty days, and refer them to the commission for determination. He recommends general railroad policies to the President. He has power to reroute traffic, to regulate adjust the use of terminal facilities, and to unify the whole transportation system in a national emergency. The principal function of the Interstate Commerce Commission is the review of rates upon complaint, and it is to be guided in its decisions by a statutory rule of rate-making laid down by Congress, which shall provide not only for the reasonableness, but also for the adequacy of rates. Wage costs are to be recognized in rate-making. Rates approved by the Secretary of Transportation are to be held presumptively reasonable. The Commission is to prescribe minimum as well as maximum rates, and to pass upon the relation of rates and upon differentials. Regional commissions are to be created under the jurisdiction of the Interstate Commerce Commission. Compulsory federal incorporation with provision for consolidation after approval by the Secretary of Transportation, is proposed. There is to be exclusive federal regulation of all railroad rates and of the issue of securities. New construction is to require a certificate of convenience, and provision is made for the modification of the legal limitations upon pooling, rate agreements, and acquisition of interest in other carriers. A wage board consisting of representatives of labor, the railroads and the public is to be constituted under the Secretary of Transportation, and pending its investigation and report, no action is to be taken by

either side that would interfere with the movement of commerce.

A plan far less revolutionary in scope, which attempts to secure the same results without disturbing the character or form of our existing railroad system, is that submitted by S. Davies Warfield as president of the National Association of Owners of Railroad Securities. This plan calls for the fixing by Act of Congress of a minimum rate of return on railroad property, to be maintained by an adjustment of the rates. Earnings in excess of the fixed rate are to be divided, under the direction of the Interstate Commerce Commission, between the employees and the corporations, the latter to use their portion for railroad betterments. A national corporation, directed by trustees consisting of the nine Interstate Commerce Commissioners and eight railroad men, is to finance the present emergency and provide an agency to purchase equipment and handle problems of unification. There are to be regional commissions with appeal to the Interstate Commerce Commission, which shall coördinate their work with the state commissions, act as wage conciliation boards and in coöperation with the Interstate Commerce Commission, supervise the issue of securities.

Other plans embodying in many cases policies similar to those described, have been suggested by individuals and organizations, both in the Senate hearings, and in occasional addresses and articles, all seeking in one way or another to remove existing obstacles to the provision of an adequate transportation service, but those that have been analyzed are sufficiently typical to indicate the general trend.

In conclusion there are presented in summary form the principles that in the judgment of the writer should be incorporated in any scheme adopted, if we are to

secure under private operation the public servi
we desire. Any adequate discussion or defense c
propositions must await an opportunity for
treatment.

1. A problem that has long been recognized, a
is in the mind of almost every one who has discus
situation, is that arising from the existence in th
territory of roads unequally equipped to compe
each other. This inequality may be due to
causes, such as the fortunate or unfortunate loca
the original line, or to the fact that one road has b
victim of financial manipulation and has suffere
unprogressive management, while the other has e
both. But whatever the cause, the fact remains
both roads charge the same rates for the same
and that is of course a necessity, then a rate that
enough to meet the financial requirements of th
road will be too generous for the strong one, and
reasonable for the well equipped road will put th
out of business. For the very obvious reason t
Association of Railway Executives includes both
in its membership, it did not squarely meet the
merely suggesting that a fair average rate sho
charged for the service, and that roads that cou
live under such rates would eventually be absor
the larger roads. My own belief is that voluntar
solidation will not succeed, that there must exis
than the permission to consolidate, that it will no
the interest of the more prosperous roads to dilut
earnings, and to carry the burdens of their less for
neighbors. There should be compulsory consoli
of the railroads, under federal charters, into a rel
few systems, in such a way that the earnings of we
strong roads could be pooled and adequate serv
sured in the sections now inadequately and ineffi

served. This does not necessarily mean a regional division of railroads into groups of uniform size. In fact, this would be undesirable if as a result it eliminated all competition in service, a valuable incentive in private operation. Rather should it create large systems, constructed to meet traffic and commercial requirements of the different sections of the country, with consolidation carried far enough to do away with wasteful competition over inadequate and roundabout routes.

2. These federally constituted corporations should be organized with a capitalization based as nearly as possible upon actual value. The government should guarantee a minimum return to the railroads upon their property employed in the public service, and should permit a somewhat higher return. Any excess earnings beyond this legal maximum should be distributed among the government, the railroads, and the employees. The government's share should be applied to meeting the guaranty on roads that have failed to earn it. This guaranty would be expected to restore the credit of the railroads and enable them to raise the necessary capital for extensions and improvements. Permission to take for their own benefit earnings in excess of the guaranty should furnish the necessary incentive to efficient operation.

3. All security issues should require the previous authority of the Interstate Commerce Commission, which should pass upon the proposed use of the funds and oversee their expenditure. This provision, together with the government guaranty of earnings, would go far to eliminate the evils of banker interference in railroad management. The banker will still have his function, but his strangle hold will be released, and he will be deprived of the pastime, occasionally indulged in, of wrecking railroad properties for the benefit of himself and his friends.

4. All rate-making power, state and interstate, should be placed under the authority of the Interstate Commerce Commission, the commission to have power not only to review rates on complaint, but as now to take the initiative in an investigation leading to a revision of rates. There should be left to the states all police powers relating to the control of operation within their borders, but the transportation industry has become so essentially national in character that state interference with rate-making is now hampering in its effects and largely unnecessary. In this connection, it is suggested that the period of suspension of rates now possessed by the commission is unreasonably long when all factors are considered and might well be shortened. Provision could be made for extension of the time of suspension when protracted hearings covering schedules of rates for wide areas were involved. The commission should have power to prescribe minimum as well as maximum rates and to determine the relation of rates.

5. A statutory rule of rate-making, such as that suggested by the Association of Railway Executives, should be adopted by Congress as a guide to the Commission. It should declare that rates should not only be reasonable and nondiscriminating, but adequate to provide a safe and satisfactory service, to ensure adequate wages to employees, and to provide a level of earnings that would protect the investment and attract the new capital needed in the public interest. This rule is a natural accompaniment to the government guarantee of a minimum return. The two should go hand in hand. Altho many insist that the power of the Commission is sufficient under existing law to meet all the requirements of this proposed rule, there is evidence in decisions of the Commission that at least certain members of that body are inclined to limit their purview to the question

whether proposed rates are reasonable or not, and are disposed to hold that the general financial condition of the carriers is a matter beyond their jurisdiction.

I am not one of those who believe that all the financial troubles of the railroads are to be laid at the door of the Commission. In fact, I believe that regulation by the Commission has been of a very decided net advantage. Yet greater generosity on its part might well be encouraged. The credit situation of the railroads is the resultant of many causes, the relative importance of which it would be difficult to estimate. The variety, extent and conflict of state regulation has been an important factor. The persistence of Congress in maintaining and strengthening all laws for the preservation of the competitive principle has been a hampering influence. The exhaustion of the more attractive forms of railroad investment, such as first lien bonds, and the increasing attractiveness and stability of other forms of investment have diverted capital funds. There is the often conscienceless and even criminal character of banker management, which has wrecked particular properties, and placed all railroad securities under suspicion. Railroad officials and directors could have done much to offset this influence, had they been free to denounce these instances of financial jugglery, to show that they were isolated and exceptional cases, and that the large proportion of railroad finance was handled on a sound and honest basis. Instead, they have injured their own credit by constantly insisting that they had none. Finally, there is the disparity between income and expense, which has had its origin not in the perversity of the Interstate Commerce Commission, but in the general upward movement of prices, a movement that has affected everything the railroad buys, including labor, but has left untouched the prices at which the railroads' own product is sold.

6. The jurisdiction of the Interstate Commerce Co mission should be extended to give it greater power o construction and service. The roads, being feder incorporated, should be permitted to make extensi only after the issuance by the Commission of a cer cate of public convenience. Power should rest with Commission to develop greater coöperation in the of terminals, in the pooling of equipment, and in elimination of unnecessarily long hauls. With th should reside the power to approve pooling and tra agreements, if they seemed desirable from the pul standpoint, altho the plan of consolidation here s gested would probably render such agreements to large degree unnecessary.

7. Provision should be made, through the creation a wage board, for the orderly settlement of wage c troversies that cannot be adjusted on the individ railroads, and the law should forbid any interruption commerce or any organized preparation therefor, dur the period of investigation and report. Such a bo should not be constituted after the fashion of an a tration board, with one member representing the pub who inevitably becomes an umpire between contend factions, and who by the very necessities of the cas incompetent to pass upon the complicated issues volved. Such a board should be constituted equally employers and employees, and their decisions should the outcome of friendly and thoro discussion.

8. Finally, it should be clearly recognized by railr men as well as by Congress that we are legislating fo public service, that the public interest is not to be c sidered merely as coequal in importance with the terests of private capital invested in the undertak but that it is a predominant interest. This pe through which we have just passed was not a tes

government operation. However, the American people, in turning the roads back to their owners have not finally disposed of the question. Rather are they putting private operation on trial. Unless the owners and managers of these properties fully recognize the obligations that again rest upon them, and develop a passion for public service that subordinates to it every other consideration, the demand for nationalization is bound to revive.

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May 19, 1919.

NORMAL PRICE AS A MARKET CONCEPT

SUMMARY

The normal price concept reflects a constructive purpose of econ theory, 632. — Margin of profit-making entrepreneurship a test of mality, 633. — Need of a market-distribution normal particularly in case of extractive products, whose supply is not expansible during cer periods, 636. — This implies merely some change of emphasis and c plementing of the equilibrium theory of value, 638. — The pe competitive market price really a normalized price, 639. — The tribution normal as a test of the efficiency of our marketing arra ments, 640. — Relation of cross-section to longitudinal view of market, 641. — Market normal of fixed-supply goods, 642. — For f products a " season's normal," 643. — This may undergo change as season progresses, 644. — Recapitulation, 648. — Three phases of market normal, 649. — Interplay of the market-distribution and duction-adjustment concepts of normality, 650. — Practical usefu of the above theory, 651.

THE differentiation of a market price and a nor price concept runs back as far at least as Adam Smi and is preserved in the writings of the great majority modern expositors of economic principles. Some s idea is practically indispensable in any formulation the subject which purposes to make economic theor constructive force in our social life and to set up sta ards for the appraisal of current economic proces All actual prices are, of course, market prices, and theoretical concept of a normal price merely sets fo some ideal of price adjustment toward whose achie ment we may strive in ordering the practices and sh ing the institutions of our production and excha system. Perhaps, on the whole, we should fare bet if we were to limit ourselves to expressions such as " normalizing of market prices " or " normality of price

thus indicating clearly that so-called normal prices are not some separate order of prices made outside the market, but are merely market prices which fulfil (or, if attained, would fulfil) certain theoretical specifications.

The test of that normality has been (in our price-motivated society) the adequacy of the price paid in the market to cover a wage which would secure the needful labor, interest which would secure the needful capital, and the necessary expenses for the purchase of raw material and the payment of insurance, taxes, and the like. All this, however, runs in terms of the adjustment of production to conditions of natural resources, human agents, technique, organization, or other factors of production, and (in its second and third phases) [1] of re-adjustment to changes in these conditions, and hence costs, of production. In short, writers have habitually given us a production-adjustment concept of price normality and have generally had their minds filled with industrialized processes of production, in which the flow of goods is continuous or, at least, has its stoppings and startings, its expansion and curtailment, largely under control toward the end and purpose of making supply such as to command a remunerative price.

This is all very well so far as it goes. But the concern has been too exclusively with the normality of supply conditions, and little or nothing has been said about the normality of the demand which comes to effective expression in the market, or concerning the adequacy of the market mechanism to bring about normal adjustments of actual supply and actual demand conditions. The stark cost-of-production concept of normal price is insufficient to the economist's need in attacking the

[1] I. e., (2) long-run normals, based on a supply which "can be produced by plant which itself can be remuneratively produced and applied within the given time," and (3) "*secular* movements of normal price, caused by the gradual growth of knowledge, of population and of capital, and the changing conditions of demand and supply from one generation to another." Marshall, Principles of Economics, p. 451.

problem of market systems and methods as a fact
price determination. And this inadequacy is pa
ularly evident in the case of those extractive prod
which are not produced by highly industrialized p
esses and for which, therefore, the conditions of su
are highly adventitious. Gold during the ninete
century would furnish an excellent case in point,
it not that its entanglement with monetary syst
complicates its value phenomena unduly. The pre
writer's interest lies in the field of agricultural op
tions, and here we may find ample illustrations for
purpose.

The production of farm crops is subject to expan
or contraction of acreage, the enthusiastic propaga
of plants and animals or the disheartened slaughte
livestock and uprooting of orchards. Likewise,
farmer may neglect his crop in midseason and e
"let the weeds take it," or he may give it extra cult
tion, fertilizer, or irrigation; animals may be "force
for maximum growth or turned out to fend for th
selves — all this in response to the inducements
discouragements which the farmer sees in the trend
market prices. These facts give us what basis ther
for the application of current theories of normal price
the farmer's business situation.

But this is not the whole story. The farmer's cho
of crops and his determination of the acreage of e
having been made irrevocably at planting time,
weather enters as an erratic modifying factor at ev
subsequent stage of the productive process. Whate
the farmer's intentions, this is the final arbiter, decidi
what volume of products shall come finally upon
market. Furthermore, that output, however
matched to buyers' needs, comes to market, thanks
the seasonal character of the industry, in some relativ

short harvest period — a fixed supply which cannot be increased until the whole long process of the suns has been gone through again, and whose flow upon the market can be checked but little even tho prices be sliding below the marginal or, indeed, the average cost of production. Even if some of the product be held back in local storage, its existence is known and discounted in the market, and prices must fall below the cost of harvest and marketing before it will pay the individual farmer to abandon a crop already grown.

These facts raise an entirely different, but highly important, question of normal adjustment, viz., that of a fixed supply to a given schedule of demand. Every price situation raises an issue of internal or market-distribution adjustment as well as an external or production adjustment. Even tho a given supply situation be highly abnormal so far as the future trend of profit-making production is concerned,[1] it might conceivably be adjusted perfectly within itself, so that every consumer secured his fragment of supply at a price no greater than that actually necessitated by the ratio of the total stock to total effective demand (transportation cost being assumed), and such that every producer secured a price which represented the full value of his produce in view of its scarcity in that particular year.[2] Such a concept of normality, in fact, lies at the very heart of our whole problem of rational market distribution, even as the older idea of a cost of production normal lies at the heart of the problem of rational adjustment of the productive process.

[1] E. g., a famine price, which would stimulate production and lower exchange values in the future; or a ruinous overproduction price, which would discourage further effort in the given line and in time raise the demand-supply ratio.

[2] With, of course, a similar limitation on the opposite side of each of these propositions. Obviously, this does not touch the issue as to whether the producer is thereby getting less than his cost of production or a fat profit above it.

Changing conditions are revealing the insufficiency the emphasis which economists generally have plac upon the former of these phases of our price discussio The distinctive character assumed by the econom exposition of any given period tends naturally to co form to, and hence be limited by, the run of attention the epoch out of which they grow. The science economics has been born and reared in a day where men have been concerned with the coming of the Indu trial Revolution, the development of capitalism, and th exploitation of new natural resources. Consequent we have been concerned very largely with the proble of profit-seeking entrepreneurship and inclined to scr tinize closely the effectiveness of our business organiz tion to equalize profits on all the various margins economic endeavor. Hence a cost-of-production norm of prices.

Today, however, the burden of exchange distributio under conditions of world trade and intense geograph cal specialization in our productive organization, b comes so heavy that our interest is to a considerab extent shifted from production to marketing problem (i. e., from the creation of form utilities to the creatio of time and place utilities) and we feel the need of careful statement of a market distribution normal prices. In securing such a statement, we need merel to develop certain ideas always implicit in the equilib rium theory of value, but not made sufficiently explicit i the expositions of value and price as found in our colleg texts or even in more advanced theoretical works.

An entirely orthodox and very common method o procedure has been to state that market prices ar prices actually paid in the market,[1] but to illustrate th

[1] Cf. Adam Smith, "The actual price at which any commodity is commonly sold called its market price. It may be above or below or exactly the same with its natu

process by which such market prices are evolved by assuming conditions of complete dissemination of information and mobility of goods, in brief "perfect competition." The result has been that what was described was not an actual price, but a highly conventionalized price such as would exist if our markets were brought from their actual abnormalities of supply and demand to a normal adjustment of stocks to market demands.

Such a procedure has often been followed, no doubt, with the laudable intention of making the matter more simple for the student. But it is the writer's experience that, on the contrary, the student finds unreal and confusing this description of a market situation admitted by the expositor to exist only in the mind's eye. It seems better practice to take actual prices from real markets and give a practical worth to their analysis by seeing what is the individual peculiarity of their situation either as concerns supply or demand conditions, which causes the price at which goods change hands to be different from those in other markets dealing in the same wares. In other words, taking the actual price at which some units of supply are equilibrated with some units of demand, we proceed to test the normality of that price equation by examining its relation on both the supply and demand side to the whole supply situation and the whole demand situation to which it is connected through the mechanism of our market system.

price"; and J. S. Mill, "The temporary, or market value of a thing, depends on the demand and the supply; . . . and the value always adjusts itself in such a manner that the demand is equal to the supply. . . . The values and prices, therefore, to which our conclusions apply are mercantile values and prices; such as are quoted in prices-current; prices in the wholesale markets, in which buying as well as selling is a matter of business; in which the buyers take pains to know, and generally do know, the lowest price at which an article of a given quality can be obtained; and in which, therefore, the axiom is true, that there cannot be for the same article, of the same quality, two prices in the same markets." Many more recent writers have failed to impose equally discreet limitations upon themselves and hence have created the impression that their discussion of a conventionalized market price is supposed to apply to all prices actually arrived at in buying and selling operations.

Such an exposition of prices as market actualiti
which, however, may and should be tested as to th
normality of their adjustment one to another in a gre
distributive system has been hindered rather thi
helped by some of the definitions of "market" whic
have been developed to take account of the expansi
of our trading spheres. Much has been said abo
central markets and national markets and world ma
kets, but a good deal of confusion exists among differe
writers as to whether we shall say that the world mark
means, for instance, in the cotton trade, Liverpool —
place where local bargains are made under the influen
of world-wide forces. If such be the meaning of th
term, Camden, Arkansas, is also a world market, sin
cotton is there bought and sold upon the basis of tel
graphic reports from the nearby spot and future marke
of the United States, which in turn are, through constan
exchange of news and the making of transactions, kep
in market contact with foreign trading centers. If, o
the other hand, the word market means the whol
"field within which the forces determining the price o
a particular commodity operate," then, in the case o
goods widely traded in, the old dictum "only one pric
in the same market at a given time" cannot possibl
remain true except in the theoretically possible bu
highly improbable event that all trading points at som
moment struck a range of mutually consistent price
(which would constitute for each of them the mar
ket-distribution normal at the moment). As a matte
of fact, all actual markets, i. e., trading places, are in
evitably local, and every market price partakes more o
less of local characters, whether they be those of th
great metropolis or of the most remote hamlet. Bu
these local transaction centers are, furthermore, subtl
fused into price-influencing relationships with eac

other throughout the commercial sphere within which the commodity is dealt in.[1] Just how perfectly this is done depends upon the perfection with which our market system does its work of equilibrating market demands and producers' stocks.

However much the exchange machinery be oiled, it is not humanly possible for friction to be entirely eliminated. Time and distance make it impossible that all the buyers and all the sellers can ever get together in that complete and perfect competition which is necessary to secure "one price[2] in a market." Obviously, the statement is true enough as applied to prices on the Liverpool and New York Exchanges. But, be this price in

[1] Clearly we are somewhat handicapped here by the limitations of our vocabulary, being distinctly in need of two words, one to indicate the local trading point which is, except in the unusually isolated case, part of a larger perhaps even international trading sphere; and another to indicate this whole market compass, of which the local trading centers are component parts. In the absence of two such distinctive terms, we must be careful not to confuse our idea of market sphere and market center. Such confusion is no more necessary than it would be to allow our idea of a circle to be dominated by the center and neglectful of the circumference and intervening area. In the making of world prices the peripheral transactions of local producers' markets are no less significant and effective than the central trading at Liverpool, New York, and Chicago. While it is true that, through the dissemination of their quotations, a tide of influence moves downward from these larger markets to the most remote scenes of buying and selling activity all over the world, it is equally true that all these remote trading spots send their own tide of influence upward to constitute the sum total of the supply situation out of which the Liverpool, New York, or Chicago price must be made. The local cotton buyer brings a certain demand to expression in his market through the offer of a price adjusted by suitable differentials to the quotations of Liverpool, New York, and New Orleans. But this demand price is endowed with no power to requisition the stocks of local producers. The supply which comes forward at this price level may not be sufficient to keep the necessary stream of cotton moving toward the great market centers, and thus the local market, by drying up the source of supplies, forces the revision of bids and a new set of quotations at the world center of trade. The desire of a small group of wilful men in the New York cotton market to dictate a world price for cotton in the fall of 1914 and in 1915 was repudiated in the little Texas towns along the Brazos quite as effectually as the autocratic presumption of Prussia to make the world's maps was checked along the Marne at about the same time. But if the international trading center fails of bringing prices throughout the whole producing and marketing area into harmony with its own ideas of value, then we must be very cautious of the way in which we apply the older concept of market price to the newly attained realities of a world trade.

[2] The writer does not, of course, mean in such an expression that prices to be one over a wide marketing area would have to be the same in dollars and cents. Equivalence, after allowing for cost of handling, is what is meant. We even assume the propriety or competitive equalization of these charges — a matter which in practice we can by no means afford to pass unchallenged.

Europe equalized never so well to this price in America, it by no means gives us one price for the markets of the world. What of disparities among local markets and between them and the central market? Has the price been so neatly adjusted in Baroda, Che-Kiang, Assouan, and Cabin Creek, Mississippi? It comes down to the point, strictly speaking, that such a formula matches concrete reality only if the word market be defined as meaning one buyer and one seller or a compact group which, by the method of auction or otherwise, are enabled to bargain as one. Only so can we guarantee that there will be but one point for the meeting of the minds of the parties to make a price contract. With every enlargement of the scope of our market which weakens the perfect solidarity of the buying or selling group, there results a multiplication of equilibrium points at which parts of the stock of goods are likely to change hands, as a diversity of marketing circumstances and arrangements cause different effective supplies to come forward out of the total available stock to strike an equilibrium with certain discrete fragments out of the total demand schedule. The "one price" becomes increasingly a theoretical ideal which, to be sure, *may* be attained to by accident or good design, but from which actual market prices ordinarily depart by a wider or narrower margin.

Only relatively few of our price exchanges are mediated by such centralized, public, and competitive agencies as the stockyards, produce exchange, fruit auction, or similar highly organized mechanisms of trade. But such a situation is the only one expounded in much modern as well as nearly all classical discussion of market price. Herein is manifest the poverty of our theory, if it fails to set forth the persistently dual nature of the price-making process, consisting as it does of

local, actual, and in varying degrees, abnormal market prices, and of ideal or normalized market price concepts, in which producers' stocks are adjusted to consumers demands through the mediation of a perfectly functioning distributing mechanism. The market price which one finds in many economic textbooks is one already considerably normalized as compared with the widely varying prices in remote, ill-informed, and imperfectly competitive trading spots where many, if not most, primary exchanges are made. But these are just the market prices which business men are dealing with, and the economist can hardly be content to leave so large and significant a part of the exchange field outside the ministrations of his value theory.

We are concerned to test the normality of the prices which scattered producers are receiving or which local buyers are paying, and this both theoretically as a means of appraising our marketing system and practically as a means of making dealers' profits or of gauging our operations as private buyers or sellers. In the case of commodities (here farm products) whose market is not fed from a flowing stream but must draw from a reservoir periodically replenished with varying degrees of fullness, the test of normality at a given moment is not so much that of the adjustment of the rate of flow of the commodity from a producing plant as it is the distributive adjustment of that fixed volume of goods uniformly in proportion to market needs so that equivalent effective demand meets equivalent supply.

If market price "is a momentary or cross-section view" of the economic process, we should see to it that our section is complete and accurate, since we are concerned to see upon this crosscut surface the relation of one part to another at a moment, just as we wish in the longitudinal section to see the relation of one to another

over a period of time. This is precisely what the tr
has in mind as he seeks a guide for his merchandi
operations. He attempts to see as fully as possible w
is the condition of the whole market, as a basis for ju
ing the acceptability of a particular price offer in wh
he is concerned. Is it "in line with the market
This is his prime consideration. If as low as or lo
than what he estimates to be the normal adjustmen
view of all the supply and demand conditions, he
buy for his own use or from speculative intent. If "
of line with the market," as being above the exch
ratio which he conceives to be the market normal
will cease buying so far as his consumptive needs
mit, or will sell short for a future profit in the da
readjusted prices.

It is evident, further, that if this idea of a distribu
normal of price under circumstances in which suppl
temporarily fixed be kept in mind, we may proceed
talk also of the normal price of goods which have
rate of supply, whose volume is permanently fi
which are, in short, non-reproducible. Such are
Masters, rare editions, natural curios, and land.
abandoning the old cost-of-production limitation u
his normal price concept the economist may talk w
out shame of what the business man is constantly m
ing his guide of action and speaking of intelligibly
correctly as the normal price of goods which have
cost of production.

What is the normal price of land? Why, clearly,
price necessitated by the adjustment of society's ne
to a limited supply. If through the blindness of
public or the lack of shrewd real estate brokers,
demands for building-room pile up unduly in cer
sections, while other suitable tracts are vacant or
poorly employed, the price of the former units sta

distinctly above and of the latter distinctly below the equilibrium point which would be struck were demands fitted to the limited supply upon a rational basis. In other words, the dealers in land have failed to perceive what was the normal adjustment of the good in which they deal, or they have been unable to effect it. On the other hand, we all know of clever real estate developers who have accumulated wealth by buying land which they have found available at a price below its normal as judged by the ratio of demand to the available supply and who have therefore found or developed a market at, or at least nearer to, that normal figure.

Similarly for old paintings, books, coins, or other objects whose means of production no longer exist. If an unknown painting by some great artist, now dead, chances to come to light in some attic or storeroom, and no one is there to apprise the lucky finder of the value which others set upon the canvas which he has unearthed, he is likely to sell it, if at all, at a figure far below the normal exchange rate which the art world puts upon this limited-supply good. Even after the picture gets out into the world of connoisseurs it will not have attained to its full normal value until such time as all potential buyers of such objects have become aware that it has been discovered and proved genuine and have had an opportunity of making their bids for its possession. Here as elsewhere, it is only when the mechanism of the market has succeeded in actually equilibrating total supply against the whole of effective demand that the resulting prices can be regarded as normal from the standpoint of market distribution.

This, as already mentioned,[1] does not imply that the price of such fixed-supply goods as are distributed far

[1] See footnote 2, p. 639.

from their place of production, and whose costs of tr
portation bear a relatively high ratio to the se
price should be priced at exactly the same figure i
those markets; but it does mean that the prices pai
the several buyers should not differ by more than t
costs of transportation and allied charges. Nor do
mean that the price shall remain unchanged throug
the whole time in which the supply is fixed,[1] for ther
carrying charges which must be added. However,
variations in the price of wheat or similar seas
products from harvest time to the coming of the
crop should not vary by more than the amount of
storage, interest, insurance, and other charges. Thi
the whole course of the season's distributive activ
should be discounted in the market normal of any pa
ular moment. In making their price adjustment
the beginning of the crop movement, both buyers
sellers are aware that not the whole of the season's
is to be equated against the moment's demand. W
each is trying to ascertain is what will be the equilibr
point of such a supply as nature has vouchsafed
such a demand as shall actually transpire. The m
extraordinary the crop failure or the more unpr
dented the year's abundance, the harder will it be
those on either side of the market to arrive early du
the crop movement at what will be the "season's
mal." Dealers know only that part of the dem
schedule which they have previously explored. If
paralleled abundance presages a marked fall in the pr
dealers are uncertain of the extent to which new uses
the commodity may develop and thus check the ne

[1] In the case of agricultural products, with which we are primarily concerne
use of the expression "fixed" supply is by no means entirely satisfactory, but se
be necessitated by the demand for brevity. Actually the stock is, of course, dwi
as the season's consumption proceeds, but the supply is fixed in the sense that th
of production cannot at the time be readjusted to relieve an existing scarcity
dundance.

sity for making extreme concessions in price in order to move the whole stock. Likewise, if scarcity dictates a high price, they are forced to guess how high it can rise before substitution will so impair demand as to leave them without the necessary number of buyers.

Under such circumstances, the professional trader and such producer and consumer groups as act with sufficient unity to give them weight in the market will seek to use every factor of uncertainty to warp prices as far as possible in the direction favorable to themselves. If both parties are in a position to back their market judgments to the limit, e. g., by holding their stocks off the market or by refraining from the purchase of supplies, the true supply and demand situation will shortly unfold itself, and an approximation at least to the distribution-normal will be brought about. If, however, one party be for one reason or another in a weak bargaining position, by virtue of his immediate need either to buy or to sell, the price may be thrown into a highly abnormal adjustment. This was clearly illustrated in the cotton crisis of 1914 and 1915. With the outbreak of the European war, the volume of demand both at home and abroad became highly problematical. Buyers at once tried to use this fact to their own advantage, and did indeed effect a severe depression of the market price level. There are always a large number of tenants and sharecroppers and not a few farm owners who must sell their cotton as soon as ginned, in order to pay pressing debts and provide for their own living expenses. This "distress" cotton continued to be dumped upon the market even when the price was forced as low as six or seven cents a pound. But bankers and merchants of the cotton section soon perceived that their own interests were jeopardized by this crowding of the price below what they conceived to

be the season's normal. As a result, they stepped in urged farmers to hold for ten and a half or eleven c and at the same time set about ameliorating the cr and storage difficulties so that this holding wouk possible. Through the bankers' associations of the ton states, acting with the Federal Reserve Bo facilities were provided whereby cotton could be w housed and immediate needs financed on wareh certificates. Once the flood of distress cotton checked, the price rose to ten, and later, above tw cents per pound.

This simply bears out the oft-repeated observa that speculative operations, whether in grain, cot eggs, or other storable products, can permanently ceed only in so far as they move with and not against tide of actual underlying market conditions. This m be expressed by saying they prosper only as they w to draw prices toward the equilibrium point of the son's normal instead of trying to jockey them int position off that actual center of gravity. This was illustrated in Leiter's sad fiasco and Patten's succes *coup* in wheat.[1] At the same time, we should remen that the distribution normal of a seasonally fixed sup even in which the whole course of the marketing sea had been discounted by dealers and others, may cha from time to time, as the factors upon which the p equilibrium has been predicated are altered by some cident or unforeseen change, before the whole distri tive movement has been completed. Thus the nor level may be raised by the destruction of a signific portion of the stock through the burning of elevator warehouses, the sinking of ships, the devastat

[1] The same point might be made in connection with the price of labor. A nice of what is the normal adjustment of the labor market at the moment tells the comp labor leader when the mere threat of a strike will produce results and guards him ag the actual calling of a strike at a time when the supply and demand ratio in that pa ular class of employment would foredoom it to failure.

wrought by floods, or (particularly in the case of potatoes, apples, and similar products) the inroads of insects or fungus enemies of the stored goods, extraordinary heat or cold, and the like. It may be lowered by the advent of some depressing influence upon demand, such as the decreased purchasing power of some important section of the consuming public, due perhaps to unemployment or the lowering of wages. On the other hand, its level may be advanced by the education of the public concerning the merits of the given commodity, or even through the changes of fashion or the spread of a food fad.

The war has given us an unusually lively appreciation of the effect of such influences upon both the supply and the demand side of our price adjustment problems. All that need be said here is that the price which is normal today becomes abnormal in terms of the equation of tomorrow's altered supply to the predicted demand or of this known supply to a suddenly expanded or contracted demand. Obviously the force of such changes cannot be instantly transmitted to every local trading center, but it must be the test of an adequate market organization that the fluidity of both supply and demand be kept at the highest possible point, so that the sudden increase of demand at one point be met by the prompt drawing of supplies from other places in proportion as their supply-demand ratio has given them a lower level of price; and that any relatively plethoric supply, instead of exerting its depressing influence wholly upon the local market, shall be so redistributed as to dissipate its force in the lowering of the price level of all markets uniformly. Evidently, the action of shrewd traders or efficient marketing organizations and the effect of such a market news service as that being developed by the United States Department of Agri-

culture are potent forces operating in this directio with a notable difference in their effects. The p agency seeks to derive the maximum personal from its operations, and whatever corrective rea ment takes place is incidental, whereas the public ligence service aims primarily at forestalling abnormality of price out of which the profes trader would otherwise extract a profit-surplus.[1]

In summary, then, all prices may be represent constituting a price body of three dimensions, its l connoting the time phase and its cross section embr all prices for the given article at a moment. All the actual or market prices, effected by the equati some units of supply with an equal volume of eff demand. But every such price is to be appraised i as to the degree of its normality measured in term perfectly functioning economic process. This c examination in practice does and in theory shoul cern itself with two matters, not merely the p adjustment of production for the market, but lik with the proper adjustment of distribution in the ket. Market adjustment normality demands that any cross section we shall have prices at a mome adjusted to each other, rationally and consistent view of market charges necessary with existing e ment) that all supply and all demand units shall each for its proper weight in the price equilibrium

For intervals of time within which conditions o ply are fixed, the distribution-normal demands tha differences shall not be greater than those necessi

[1] In the absence of such informational service, the consuming public is likely t up to a high level of price on the justification of local scarcity, at the same time producing section which has enjoyed a good growing season is being held down a level as possible on the basis of that local abundance. The quick dissemi thorough and accurate knowledge concerning market conditions which c change rapidly and radically is necessary if prices are to be kept anywhere n distribution-normal.

by carrying charges or justified by changes which have come about through the loss of part of the stock or through modifications in the demand. For agricultural products, the " season's normal " predicates the correct discounting of such conditions over the market distribution period until the next harvest but, where new factors are introduced during that time, the prompt revision of price schedules. In this longitudinal section are revealed also the alignment and realignment of prices with costs of production, whenever opportunity offers to increase the profitable or decrease the unprofitable line of production. Marshall has pointed out three phases of the production-adjustment normal of price, viz., short-time, long-time, and secular movements. A similar threefold division might also be made of the distribution-normal concept, as follows:

I. Prices normal in the sense of being the best equilibration of supply and demand possible with the imperfect market equipment of the present.

II. Prices normalized through adjustment by a market mechanism remodeled in the light of a previously unsatisfactory price situation. The improvements of storage and transportation facilities, better financial arrangements, and more efficient commercial organization of trading agencies exemplify this phase clearly in the case of agricultural products during the last few decades.

III. Prices readjusted through slow-moving changes in the market attitude of both producers and consumers, such as the education of sellers in the fundamental principles in accordance with which the price-making system operates and, more concretely, the character of demand in those places to which they look for a market; or changes in the standard of living, the rovings of taste and custom, and the education of buyers as to the in-

trinsic qualities of the goods which they consume. The study of the marketing of farm products, the teaching of home economics, and the Food Administration have contributed to our understanding of this third phase in recent years.

In II and III there is revealed a distinct *rapprochement* between the market-distribution and the production-adjustment concepts of normal price. We are well aware that readjustments in production react upon the distributing machinery, while every modification of the exchange process exerts a reciprocal influence upon the productive organization. Thus, defects in our marketing system may so depress the price of a given commodity at some points as to cause returns to fall below the cost-of-production normal, thus forcing certain of the less favored producers out of the field, at the same time that the normal equilibrium of existing supply and demand would set the price at a point high enough to continue them in the business on a prosperous basis. Or, on the other hand, an abnormal exchange situation might so inflate prices as to retain producing units whose withdrawal would be indicated, were the normalizing influence of profit-seeking adjustment on a cost-of-production basis not obscured by this abnormal market situation. Each change in production creates a new market problem; each readjustment of the exchange mechanism alters in some measure the terms of the producer's problem.

There should be no discontinuity in our concept of the normalizing process, from the most local and ephemeral adjustment of even one unit of supply to one unit of demand, up through the harmonizing of the single value estimate so struck with others elsewhere, so that the whole stock may be valued in exchange upon a consistent basis; from this to the yet remoter idea of mak-

ing this level of values fit harmoniously into the whole scheme of market values by being made (through the checking or acceleration of the rate of supply) to correspond with the market prices of their component cost goods. So to complement the cost-of-production with the analagous market-distribution normal is not to present merely an engaging abstraction for the theorist to toy with but, on the contrary, to enunciate the value principles which must govern the practical endeavors of business men in adjusting our machinery of market production and exchange. It expresses the essential truth which, sometimes crudely and of course intuitively, the farmer has had in mind when demanding relief from the erratic fluctuations of the markets in which his products are sold. It has lain back of the efforts of the Food Administration and other agencies to " stabilize " values during the war period. Likewise, it must underlie whatever truly sound work shall be done in the future toward improving the conditions of our agricultural organization, through equalization of shipments, dissemination of complete market news, intelligent proportioning of producers' efforts and outlays, upon which a truly healthy development of the industry must depend.

It is a highly practical proposition because it is sound economic theory.

E. G. Nourse.

Iowa State College.

ON STABILIZING THE DOLLAR

SUMMARY

Inconveniences of an unstable value unit, 652. — Dr. Fisher's proposed remedy, 652. — Would his goods standard be stable? 658. — Unstable relation between goods and labor, 660. — Value dependent on human estimation, 661. — This not stable as to goods or as to labor, 665. — Can present monetary units be stabilised? 667. — Control of issues of paper money, 667. — Control of gold production, 668. — How would Fisher's plan affect the public debt? 670.

Most of us have learned from experience that a dollar will not buy so much as it used to buy, but many of us remember a time when our experience was just the reverse of this; for it is scarcely twenty-five years since a period of falling prices came to an end. Then debtors whose contracts ran for a number of years were at the disadvantage of having to pay back dollars of larger purchasing power than was possessed by the dollars they had received. Now creditors, under like circumstances, have reason to complain that the dollars repaid to them have a smaller purchasing power than had the dollars which they lent; and people whose earnings have remained stationary, or failed to increase as fast as the prices of commodities, have found it increasingly difficult to pay their bills.

Dr. Irving Fisher in a pamphlet issued as a precursor of his forthcoming book on Stabilizing the Dollar in Purchasing Power, has expounded his plan for putting an end to such unpleasant experiences by keeping the variations in the purchasing power of the dollar within very narrow limits. That he somewhat underestimates the direct effect of the world war in raising the cost of living and, as I think, correspondingly overestimates

its indirect effects through its expansions of currency and credit, is a secondary matter. So also is his inclination to throw upon our unstable dollar more than its just share of blame for the existence of social discontent. What I am here concerned with is the plan itself and, as it seems to me, a fundamental error which underlies it.

Dr. Fisher recognizes the fact that, to a greater or less extent, he has been anticipated by others. The various writers who have discussed a " tabular " or " multiple " standard of value seem to have assumed that, if so constituted as to be accurately representative of goods in general, it would afford a just standard for deferred payments; and this is the assumption which underlies Dr. Fisher's plan of stabilizing the dollar. From this point of view, he has a considerable advantage over earlier writers on the subject in the fullness of the price records now available and the elaborate systems of index numbers based thereon. Yet one may be permitted to doubt whether it is possible to construct, even with all these helps, a standard which shall measure the price movements of goods in general with a very high degree of accuracy, tho Dr. Fisher compares the results at which he aims with those attainable through the yard-stick in measuring length.

" What is needed," he says, " is to standardize the dollar, just as we have already standardized the yard-stick, the pound weight, the bushel basket, the pint cup, the horse power, the volt, and, indeed, all the units of commerce except the dollar."

And his plan for accomplishing this object is to take, at a suitable time, a dollar's worth of carefully selected goods, which shall thereafter serve as a measure of value for goods in general, including gold.

" A true standard of value," he says, " should not be dependent on one commodity merely, whether that

commodity be gold or silver, or wheat or what not. Two commodities would be better than one"; and "a composite of gold, silver, copper, platinum, and all the other metals would be somewhat more stable than an amalgam of two, just as a number of tipsy men can walk more steadily arm in arm than two only, it being wholly unlikely that all the men in the line would lurch in the same direction at the same instant."

Metals, however, are not the commodities to which Dr. Fisher would assign a leading place in constructing his standard. He says:

> In order to secure a dollar constant in its purchasing power over goods in general, it should, in effect, be a composite of those very goods in general. For instance, we might imagine a composite commodity dollar consisting of 2 board feet of lumber (made up of various kinds); 1/20 of a bushel of wheat; 3/4 of a pound of steers; 1/2 of a pound of meat; 30 pounds of coal; 1/100 of a barrel of white flour; 1 pound of sugar; 1/2 of a pound of hogs; 1/3 of a pound of cotton; 1/3 of a gallon of petroleum; 1 egg; 1 pint of milk; 1 ounce of butter; 1/30 of a bushel of corn; 1/25 of a bushel of potatoes; 1/100 of a pair of shoes; 1 1/2 pounds of hay; 1 ounce of hides; 1 ounce of tobacco at the farm; 1/2 of an ounce of manufactured tobacco; 1 1/2 ounces of lard; 1/2 of an ounce of leather; 1/7 of an ounce of wool; 3/4 of a pound of steel; 1 ounce of copper; 1/10 of an ounce of rubber; 1/300 of a gallon of alcohol; 2 ounces of soap.
>
> These happen to be the relative quantities of some of the three hundred commodities used by the United States Bureau of Labor Statistics in making up its index number of prices. The entire list, of which the articles specified are the more important, was actually worth one dollar in 1909.
>
> If at that time we had established such a dollar as our unit — that is, a composite dollar consisting of a big basket containing those three hundred bits of goods — that composite basketful of commodities — or "goods-dollar," let us call it — would evidently have to be worth a dollar at all times; and the cost of living — at least the cost of the representative assortment in that basket — could not rise or fall. That assortment would always cost a dollar simply because a dollar is that assortment.

Accepting the "goods-dollar," or "composite basket of goods," as a thing of stable value, Dr. Fisher would

stabilize the gold dollar by preventing its value from diverging materially from that of his proposed goods standard, and this he would do by making it heavier, if its value, as compared with that of the "goods-dollar," is found deficient or lighter if its value, when tried by the same test, is found too great.

To avoid the confusion and inconvenience of having gold dollars or gold eagles of different size and weight circulating side by side or jingling together in the same pocket, Dr. Fisher proposes that the money in actual circulation shall be of paper only. He proposes that gold certificates be used instead of gold coins, as, indeed, they already are in most cases. He says:

> If gold thus circulated only in the form of paper representatives, it would evidently be possible to vary at will the weight of the gold dollar without any such annoyance or complication as would arise from the existence of coins. The government would simply vary the quantity of gold bullion which it would exchange for a paper dollar — the quantity it would give or take at a given time. As readily as a grocer can vary the amount of sugar he will give for a dollar, the government could vary the amount of gold it would give or take for a dollar.

Passing over certain details, I quote again from Dr. Fisher's pamphlet:

> A definite and simple criterion for the required adjustments [1] is at hand — the now familiar "index number" of prices. The Bureau of Labor Statistics, which now publishes an index number, the Bureau of Standards, or other suitable government office, would be required to publish this number at certain stated intervals, say monthly. That is, each month the Bureau would calculate from current market prices how much would have to be paid for our composite basket of goods. This figure it would publish and proclaim; and this figure would then afford the needed official sanction to the Secretary of the Treasury to change the amount of gold which the mint would give or take for a gold certificate, and thus increase or diminish the purchasing power of that certificate. The certificate would always be equal to the gold dollar; and the gold dollar would be kept equal to the goods-dollar, which is the ultimate standard.

[1] The periodical changes in the weight of the gold bullion dollar.

After illustrating in some detail the small monthly changes in the weight of the dollar that would, as he anticipates, follow the adoption of the goods standard during a period of rising prices, Dr. Fisher says:

> And, so, as long as the index number persists in staying even a little above par, the dollar will continue to be loaded each month until, if necessary, it weighs an ounce, or a ton for that matter.

It will be seen from Dr. Fisher's frank recognition of the extent to which the dollar might be weighted in case of necessity that hardly any conceivable increase in the supply of gold, either from the discovery of new sources or from improved methods of extracting the metal, could cheapen it too rapidly to permit the weight of the dollar to be increased with equal speed. Dr. Fisher's plan would, in fact, open an unlimited market for the produce of the gold mines of the world, and the incentive to their rapid exhaustion which it would thus offer is enough to make the hair of a conservationist stand on end. For this, however, the plan makes some atonement, and we must accompany Dr. Fisher a little further in his account of its operation. He says:

> Or, suppose the index number falls below par, say 1 per cent below. This fact will indicate that the purchasing power of one dollar has gone up. Accordingly, the gold dollar will be reduced in weight 1 per cent, and each month that the index number remains below par the now too heavy dollar will be unloaded and the purchasing power of the certificate brought down to par. Thus by ballast thrown overboard or taken on, our index number is kept from wandering far from the proper level — that is, from the price of one dollar per composite basket of goods. In short, the adjustment, like all human adjustments, takes place " by trial and error." There is always a slight deviation, but this is always in process of being corrected. . . .
>
> All dollars, bank notes, etc., yellowbacks, and gold bullion would be absolutely equivalent to one another and would be approximately equivalent to the composite or goods-dollar. We would then be substantially rid of a fluctuating price level with its long train of

bad consequences. The monetary yardstick would at last be standardized.

It may seem a long look ahead to think of a period following the exhaustion of the world's gold mines, but a period of greatly diminished production of gold may possibly be much nearer than we imagine; and it must be placed to the credit of Dr. Fisher's plan that its provision for progressive reductions in the weight of the dollar (or other monetary unit) would, in principle, be adequate to almost any exigency that could possibly arise as a result of long continued diminishing supplies of gold. For just as the weight of a gold dollar would, if necessary, be increased to " an ounce or for that matter a ton," so its weight could be diminished to any conceivable extent. Even if gold became more precious than radium now is, the allowance of gold bullion per dollar could be made sufficiently minute to meet the requirements of the situation; for, as coins are not to be struck or circulated, no difficulty would arise through a dollar's becoming too small for convenient handling, or even so small as to be visible only through a microscope. But the same principle which permits an indefinite reduction in the weight of the gold (bullion) dollar would, of course, permit the substitution of silver or even a baser metal to an equal value, if that should on the whole be the more expedient. It would only be imperative that any such change be made with the faithful intent and actual effect of keeping the dollar at par.

But this brings us face to face with the fundamentally important question whether the par proposed by Dr. Fisher is a safe and satisfactory one, and this must now be considered.

Would a Goods Standard be Stable?

We all know that in a progressive condition of industry, such as now exists, the value of goods, as measured, for example, by the average amount of labor required for their production, is constantly and quite rapidly changing. So, too, is the value of either goods or labor, if measured by its true determinant, namely, the estimate placed upon it by human beings.

Dr. Fisher's plan of stabilizing the dollar, if perfectly realized in practice, would guarantee to a lender a quantity of goods equal to that represented by his loan when made. Let us suppose twenty-five years to elapse before the debt is paid. In the meantime there have been great improvements in machinery and industrial processes, and a great increase has taken place in the extent to which such improvements are used. There has consequently been a great increase in the average productivity of human labor. For convenience, we may suppose that it has doubled, and that the debtor in the case under consideration is able to produce or procure as large a quantity of goods as his loan represented when received with half the labor which it would then have cost him. Is it fair that he should get off so lightly?

Let us first consider a case in which this question must be answered affirmatively. Let us suppose that the increasing productivity of labor is steadily accompanied by an ever-growing eagerness for educational opportunities, not only among the young, but throughout the community. This will necessarily carry with it a corresponding eagerness for reduced hours of labor; and we may, in fact, suppose that the entire advantage arising from the increased productivity of labor is taken

in that form [1] and in the increased leisure thus made available for educational uses. We may further suppose that, aside from certain beneficial changes in their distribution, there is no alteration in regard to goods, or, at least, no change in the average consumption per capita, people in general caring little for luxury or display and finding their satisfaction in "plain living and high thinking."

Under such conditions our supposititious creditor need only receive the quantity of goods represented by his loan when it was made. With that quantity he will be able to maintain his social status and meet all the requirements of his time and circumstances as completely as he could have done with the same quantity twenty-five years before. And, altho by our hypothesis his debtor can now produce or procure that quantity with half the labor which it would then have cost him, his performance of that half now involves as large a sacrifice as would have been involved twenty-five years ago in performing the whole. In doing that then, he would only have been doing what all his fellow citizens were then doing. In doing it now he would be depriving himself of educational opportunities which by our hypothesis all his fellow citizens are now enjoying, and during the entire time occupied in earning the means to pay his debt he would be falling behind them in the intellectual race, making himself a helot, and undergoing a positive social degradation. In short, under all the supposed conditions, the creditor in receiving goods equal to those represented by his loan when made would receive a degree of satisfaction equal to that so represented, and

[1] It will be seen further on that this supposition does not go far beyond what has been seriously proposed for Great Britain by a great employer of labor, who, with a view to getting a largely increased use out of machinery, suggests a six-hour day for men and women and, through six-hour shifts of human labor, a twelve, eighteen or twenty four-hour day for the machines.

the debtor in performing a diminished amount of labor would make as great a sacrifice as the larger amount involved at the earlier date. It may, therefore, be conceded that under such conditions the goods standard proposed by Dr. Fisher would be a just standard for deferred payments.

But suppose that the increasing productivity of labor is accompanied by just as rapid an expansion in the demand for goods, so that in one form or another the average consumption of goods increases just as fast as does the ability to produce them — a supposition that will not seem extravagant, if we remember that "use," as of implements, vehicles, buildings, etc., "is slow consumption," and think of the wide margin there is for expansion in the single form of roomier, prettier, and more sanitary dwellings for the poor, to say nothing of the many other lines along which expansion might advantageously take place. Let us suppose, then, that the desire for goods — including such goods as ships, flying machines, buildings, etc. — has on the whole increased just as fast as the productivity of labor; that to satisfy this desire it is necessary to work just as hard as if no industrial progress had been made, and that the general feeling of the people towards goods on the one side and labor on the other, is such that they voluntarily choose so to do. In that case justice as between the debtor and his creditor will require that settlement be made upon a labor basis. Under such conditions the creditor may justly claim that the quantity of goods represented by his loan when made no longer corresponds to the extent of the desire for goods, or to the increased need of them created by the change in social usages and standards. To get a degree of satisfaction equal to that represented by his loan when made, he must, in fact, under the changed conditions supposed,

receive twice the quantity then so represented, or else its equivalent in goods of better quality. Nor can the debtor justly complain, under the supposed circumstances, at having to perform, in order to get this increased quantity of goods, as much labor as was represented by the loan when received; for, altho by our hypothesis labor has become more effective in producing goods, it has, in this respect, merely kept pace with the increasing quantities required by a more and more exacting social standard. Moreover, in performing the amount of labor represented by the loan when made the debtor is subjected to no adverse discrimination; for by our hypothesis he and his fellow citizens generally are of their own choice working just as hard as it was customary to work twenty-five years ago. In short, under all the supposed circumstances, the creditor receives only the degree of satisfaction and the debtor makes only the amount of sacrifice originally represented by the loan. In this case, therefore, the goods standard proposed by Dr. Fisher would fall short by one-half of satisfying the requirements of justice and as a standard for deferred payments would be a signal failure.

In a stationary condition of industry a goods standard and a labor standard might coincide and both might coincide with a just standard of value.

Our suppositions in reference to a progressive condition might have been pushed further than they were; for conditions are conceivable under which a creditor might justly expect an increase in the quantity of goods returned to him more than proportional to the increase in the productivity of labor, or, on the other hand, under which a debtor might with equal justice expect to meet his obligation with an amount of labor diminished more than proportionally to the increase in its produc-

tivity. But the suppositions actually made went in each direction somewhat beyond the bounds of probability; for in practical experience [1] "it is reasonably sure to happen that as the productivity of labor increases, a part of the advantage resulting from its increase will be taken in the form of increased consumption of goods, while another part is taken in the form of increased leisure. And when the course of human feeling with reference to goods on the one hand and labor on the other is of this character," a just standard of value would give the creditor a somewhat increased amount of goods and exact from the debtor a somewhat diminished amount of labor. "In ordinary experience it probably would not be far from the mark if our standard were of such a character as to divide the results of industrial progress about equally between the debtor and the creditor; but from the point of view of economic theory there is no assurance that this would be the case. All would depend on the course of human feeling in the premises.

"Theoretical completeness would require us to consider a condition of industrial retrogression, and such a condition might be treated in much the same manner in which we have already treated the condition of industrial progress that corresponds to our actual experience at the present day"; but it is sufficient for our present purpose to point out that, wide as are the limits within which suppositions may reasonably be made as to the course of human feeling in regard to goods and labor, only in one out of the indefinite number of cases lying between the two extremes would a goods standard be a just one, and that this single case lies,

[1] The quotations which follow are from a paper entitled "Tests of Stability in the Value of Money," which the writer of this article presented in 1894 before Section I of the American Association for the Advancement of Science. See Proceedings of the Association for that year.

as already remarked, somewhat beyond the bounds of probability.

The changing relation between labor and goods inherent in a progressive condition of industry is noticed in the Report of the Monetary Commission published in 1898. On page 94 we read:

"Exactly as the world has been able to increase its efficiency in production and in obtaining satisfaction for mankind at less effort, the same labor and sacrifice has given forth a larger result." And the bearing of this circumstance on the proposal to adopt a multiple (goods) standard is recognized in the following passage from page 107:

> The theory of justice in the Multiple Standard is based on the assumption that the creditor should have only the same quantity and quality of goods at the end as at the beginning of the contract; but if, during the continuance of the contract, advances in the arts have enabled society to produce these goods at less cost, it cannot be contended that this result has been due to the individual exertions of either the creditor or the debtor.

The word "cost," as used in this extract, might, of course, mean cost in money, but the context shows that the fact of a diminished cost in labor had a prominent place in the writer's mind. He does not carry his analysis so far as to indicate the conditions under which a creditor might, or might not, fairly expect more goods than his loan represented when made, but he plainly sees that the changing relation between goods and labor is a fact which demands consideration before a "composite basket of goods" — to use Dr. Fisher's phrase — can safely be adopted as our fundamental unit of value.

The special claim made on behalf of the tabular, or multiple, standard is that it is a just standard of value for deferred payments; but it clearly is *not* a standard of stable value, for the "composite basket of goods," or "goods dollar," which Dr. Fisher proposes to adopt as

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usage in regard to both labor and goods. I

[1] As bearing upon this point an essay by J. Shield Nicholson on " Th
of Variations in the Value of the Monetary Standard," which is included
Money and Monetary Problems, may be read with advantage.

problem of determining what periodical changes of weight a gold-bullion dollar would require in order to become a just standard for deferred payments is very much less simple than Dr. Fisher's plan assumes; and it is greatly to be feared that if we undertook to make such changes, our work would be sadly lacking in that accuracy which, according to Dr. Fisher's own contention, modern business imperiously demands — so badly lacking, in fact, that, instead of a dollar stabilized as to value, we should have a dollar of which neither the value nor the weight would be known to any one for more than a few weeks in advance. It is doubtful whether a dollar so lacking in definiteness could be made the basis of contracts enforceable at law.

As Jevons aptly says: "Value is the most invisible and impalpable of ghosts, and comes and goes unthought of while the visible and dense matter remains as it was."[1] Yet it is precisely this evanescent thing called value in respect to which the dollar must be stabilized, in order to make it a just standard for deferred payments; and that cannot be accomplished by stabilizing its relation to another unstable thing.

Dr. Fisher, of course, assumes that his proposed assortment, or "composite basket," of goods is not unstable in its value, or that it is, at least, so much less so than gold as to justify the fundamental change in our monetary system which would be involved in adopting that assortment as our ultimate unit of value. When the bare minimum of goods necessary to subsistence was about all that the mass of men could hope for, a "basket of goods" selected with reference to their certain and imperative needs might possibly have had a considerable stability of value;[2] but in our time there is a wide

[1] Investigations in Currency and Finance, p. 80.

[2] It would probably have been subject to rather serious fluctuations from year to year, tho comparatively stable on an average for long periods.

margin for choice between goods of many kinds, between tangible goods like coal or bread and intangible goods like a moving picture show or a concert, and, in general, between goods and leisure, or, say, between goods and the mental attainments for which leisure would provide opportunity.

And think of the tremendous change in the relation between goods and labor that would be involved in the execution of such a plan as Lord Leverhulme — a practical business man and large employer — has seriously proposed for Great Britain. In view of the vast financial obligations incurred in the prosecution of the war, he declares it to be necessary that the machinery available for industrial uses shall be far more fully employed than it has been in the past. "We must have," he says, "a six-hour working day for men and women, and by means of six-hour shifts" of human labor "we must work our machinery 12, 18 or 24 hours per day." Think, too, of the still greater change that would attend the adoption of a similar plan in the United States, where machinery is far more extensively used than in Great Britain. There probably has never been a time in the history of the world when a goods standard of value would have had so little definiteness or stability as it would have today — never a time when the kinds of goods to be chiefly in demand were so subject to great and unforeseeable changes.

Under present conditions a contract to give or receive a certain number of dollars is a contract to give or receive a perfectly definite *quantity* of gold or its legal equivalent; and, tho its value is confessedly subject to change, it is comparatively free from sudden and violent fluctuations. "The precious metals," says Walker, "have a high degree of steadiness in value from season to season and from year to year, far exceeding in this

respect any other considerable class of substances." The existing stock of them is so large that the supply of them is comparatively independent of the output for any one year, or even a number of years; and, imperfect as our gold dollar undoubtedly is as a measure of value through any considerable period, it will probably be far safer to retain it and strive to remedy its defects than to abandon it in favor of any assortment of goods which could now be selected as its substitute.

Can Present Monetary Units be Stabilized?

Since the value of money, like that of other things, is subject to the law of supply and demand, the way towards a stabilization of that value apparently lies through a careful observation and study of all the facts and circumstances by which changes in the value of the monetary unit are indicated, with a view to such an adjustment of supply to demand as may keep those changes within the narrowest limits possible. This would, of course, be no easy task, but if the effort were for a time attended by scant success, we should at least have our dollar of definite weight and fineness with which to do business while striving for better results. The data required as a guide to our efforts along this line would be much the same as those which would really be necessary to secure any approach to success along the line proposed by Dr. Fisher; for, as already pointed out, price lists alone, with the index numbers computed therefrom, would fall far short of supplying all the criteria indispensable to the success of an attempt to stabilize the value of the dollar by periodical changes in its weight.

The regulation or control of the issue of paper currency is already pretty generally recognized as a proper

function of governments; and, great as the e
governments have been in the issue of incon
paper money, there are conspicuous instances of
and successful management continued throu
periods, if not directly by governments themsel
institutions acting as their agents under strict le
control; such, for example, as the Bank of E
Should success attend the effort to assure durabl
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for that has most frequently been the subordin
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royalties would serve the same purpose. In
should there be such, in which the mining of gold c

[1] Through many decades prior to the world war the Bank of England
rate of discount whenever its gold reserve was threatened with
kept its notes at par with coin and its bullion equivalent, but in
undue expansion of credit, influenced in an effective degree the
the kingdom, encouraged the exportation and discouraged the
dise, and protected the country against a too serious adverse
See an interesting statement on this subject in the First Interim
Committee on Currency and Foreign Exchanges after the war.

is operated by a government, a league of nations might properly suggest diminished or increased activity, as either might be rendered desirable by the circumstances of the time. The supply of the precious metals at just the rate to assure as far as possible their continuous equability of value is essentially a world problem, and the formation of an effective league of nations, if successfully accomplished, should contribute greatly towards as good a solution of it as is at all practicable.[1] This, at least, is a line along which either separate nations or a league of nations can experiment for a century, learning from experience as time goes on and running little, if any, risk of producing in the meanwhile such industrial, commercial and financial chaos as would result from the failure of a plan like Dr. Fisher's. If incidentally to the effort to regulate the supply of gold and silver the earth's latent stores of these metals should be made to contribute generously to the revenues of some of the debt-burdened governments and thereby lighten the burden of general taxation, the result would be welcome in full proportion to its magnitude, whether that should prove small or great.

In connection with what has been said of increasing or diminishing taxation and royalties as a means of retarding or accelerating the production of gold or silver, mention may here be made of the proposal to subsidize gold mining which is now seriously put forward in certain quarters on the ground that the needed quantity of gold cannot otherwise be profitably produced under present industrial conditions. At bottom this seems to be virtually a proposal to lessen the gap between gold and depreciated paper money by making gold more plentiful and, therefore, cheaper. Rather than resort to

[1] Whether a league amounting practically to a world state could yet be safely constituted is, however, much too large a question to be decided hastily.

so expensive a remedy for currency depreciati
nations in which such depreciation exists shoul
remain if necessary for an indefinite period, ac
however, the promptest and most effective mea
prevent it from proceeding any farther. The w
surely had inflation enough for the present
increasing the evil by adding inflation in gold to i
in paper.

How Would Dr. Fisher's Plan Affect Public Debt?

In regard to the gold obligations of the gove
the effect of the adoption of Dr. Fisher's plan w
course, depend altogether on the course of
Should these continue to rise by a small per
every month or two, involving the necessity o
sponding increments in the weight of the gold
these gold obligations would, of course, be ma
increased. But it is, perhaps, quite as likely t
return of peace may usher in a period of falling
in which case successive diminutions in the weigh
dollar would have the opposite effect. In any
goods standard would bring to the government
vantages that may accrue from improved in
methods, processes and appliances, whereby th
cost of commodities may be reduced.

But the concern of the government will, of co
with the strict observance of its contracts a
maintenance of its credit, and its policy will pres
be dictated by a desire to do as nearly as possib
exact justice requires, keeping a straight course b
its creditors and the taxpayers and showing no
ness to either at the expense of the other.
whole, however, the fact that its great loans ha

floated on the basis of a dollar of 25.8 grains of standard gold will have great weight as an argument against making any change whatever in the weight or fineness of that dollar. Moreover, any such change might seriously endanger the success of any loans which may hereafter have to be negotiated.

EDWARD T. PETERS.

GOVERNMENT CONTROL OF SUGAR DURING THE WAR

SUMMARY

I. Introduction: The four periods of government control, 672. — II. The problems relating to sugar for the crops of 1918–19, 674. — (*a*) Problems relating to price, 674. — (*b*) Problems relating to supply and distribution, 687. — III. The solution of these problems through the formation of the United States Sugar Equalization Board, 693. — (*a*) Formation of the United States Sugar Equalization Board, 693. — (*b*) Solution of the problems relating to price, 695. — (*c*) Agreements with the various producers, 702. — (*d*) Solution of the problems relating to supply and distribution, 705. — IV. Conclusion, 710.

I. Introduction

There is hardly any aspect of government control during the war which offers so rich a field for economic analysis and study as the control of the entire sugar industry by the United States Food Administration. Initiated with modest appeals to the public by Mr. Herbert Hoover in June, 1917, for voluntary reduction in the household consumption of sugar and with a voluntary agreement with the beet sugar producers in the latter part of August, 1917, a continuous development took place, culminating ultimately in complete government control of the entire sugar trade from the points of production to the points of ultimate distribution.

The activities of the Food Administration in so far as they relate to sugar fall into four well defined periods. The first period marks the transition of the sugar industry from a peace basis to a war basis, covering in point of time the second half of the year 1917. The Food Control Act which was the legal basis for all

the activities of the Food Administration, was enacted in this period, and the Sugar Division of the Food Administration under the able executive direction of Mr. George M. Rolph, took form at this juncture as a constituent entity in the organization of the Food Administration. During this period voluntary agreements with the different sugar producers, relative to both prices and distribution of the 1917–18 crop, formed the basis of control over the industry.

The second period runs from January to about May, 1918, during which time the machinery created in the first period of governmental control, to handle the problems of the 1917–18 crop, functioned automatically with practically no amendment.

The third period, probably of greatest interest to the economist, covers the interval between May, 1918 and the signing of the armistice, in which period plans were formulated for the handling of the more difficult problems relative to price and distribution involved in the 1918–19 crop. This period witnessed the creation of a sugar corporation, the United States Sugar Equalization Board, Incorporated, the $5,000,000 of capital stock of which was subscribed for by the President of the United States out of his emergency funds, the purposes of this corporation, being, "to equalize the cost of various sugars and to secure the better distribution." [1]

The fourth period begins with the signing of the armistice. The abrupt termination of the war found the United States Sugar Equalization Board bound by several contracts, for the execution of which a continuance of the corporation was essential. Up to the date of writing, the activities of the corporation for this fourth period have been mainly of a routine nature and no important economic problems have developed, altho

[1] News Release of Food Administration, July 11, 1918, No. 1061.

it is of interest, to note the effect of governmental control upon an industry during a period of post-war reconstruction.

Since the first period has already been discussed at some length in a previous number of this journal,[1] and has been, in addition, the subject of a senatorial investigation, it will be unnecessary to treat it here. The second period covering simply the automatic functioning of the machinery created in the first period needs little discussion and the fourth period, not being a complete episode as yet, can be treated more profitably at a later date. In this paper an account will therefore be given of the third period which is indeed the most significant period.

II. The Problems Relating to Sugar in Connection with the Crops of 1918–19

(a) *Problems Relating to Price*

The third period of government control of sugar in the United States, as the following pages demonstrate, witnessed the realization of Mr. Hoover's original plan for dealing with this commodity. Speaking before the Senate Committee on Agriculture on June 19, 1917, Mr. Hoover had stated his plan[2] as follows:

> There is one other commodity which I may refer to in this matter of purchase and sale, and that is sugar. At the present moment our sugar refiners are competing with the allied sugar commission for the purchase of Cuban sugar. It must be patent that if we create a sugar commission and if that sugar commission coöperates with the Allies and the Cuban producers to take over the Cuban crop at the fixed price, that we can effect a considerable saving on the present inflated price of raw sugar, and we can stabilize the price of sugar throughout the whole of next year, because the sugar commission should be able to impose upon the refiners the necessity to pass the savings made on raw sugar through to the consumers. As there

[1] See article by Roy C. Blakey, "Sugar Prices and Distribution under Food Control," Quarterly Journal of Economics, August, 1918, pp. 567–596.

[2] From Food Administration Bulletin, No. 1, 1917.

would be a dominating amount of imported raw sugar it should be possible to maintain a stable price throughout the next year; there would thus be no incentive to speculation, and the saving to the public on its sugar should reasonably amount to 20 to 25 per cent.

There can be no loss in such an operation, because one-half of the American sugar supply would be in the hands of the Sugar Commission, and the Sugar Commission should be able to make a price to cover the whole of its outlay. In this matter, like that of wheat, we require a certain margin of cash with which to provide for bank credits. So far as I can see now there are only three or four commodities where we are likely to enter actively into the purchase and sale. In the case of wheat and sugar we have taken the opinion of the producer, of the manufacturer, and of the distributor as to the effectiveness of such operation in reducing prices to the consumer, and I feel confident that there is general agreement and entire safety and usefulness and necessity in this course. We should take similar advice before entering upon any other commodity.

But the Food Control Act, when it was enacted, did not give the Food Administration the authority to fix sugar prices directly or to make purchases of sugar as had been done abroad so that it was necessary to depend on the voluntary coöperation of the various branches of the sugar trade. Through such voluntary coöperation, the various agreements, with the domestic beet sugar producers, with the Louisiana cane sugar producers, and the cane sugar refiners were effected as well as the purchase of the entire 1917–18 Cuban crop for account of the United States and the British Royal Commission on the Sugar Supply.

Early in 1918 it became apparent that the problems relating to sugar could no longer be effectively solved through these separate voluntary agreements with the different branches of the trade and through the existing executive machinery of the Food Administration. For there were two sets of problems facing the Food Administration in 1918, the first concerned with the proper prices for the 1918–19 crops, in the various sources of supply, the second concerned with supply and distribu-

tion. In its attempt to solve these problems, the Food Administration was ultimately forced to create a commission of the sort Mr. Hoover had described before the Senate Committee on Agriculture in June, 1917. A careful examination of the problems which led to this result is essential for a clear understanding of the whole matter. These problems are set forth in the first part of this paper, and the second part is devoted to an exposition of the manner in which these problems were solved.

The difficulties of the Food Administration in regard to the price of sugar for the 1918–19 crop emerged from its accepted policy of encouraging domestic sugar production. For early in the history of the Food Administration there was definite acknowledgment of the fact that an encouragement of domestic sugar production was highly desirable mainly because of the necessity for conservation of import tonnage but also in view of the gradual reduction in the world's supply. It was hardly to be expected that war conditions with the consequent reduction of the labor supply, the high prices paid for competing crops, and the high cost of materials would allow much increase in the domestic sugar production but it was essential to take measures to maintain, at least, the normal production.

In anticipation of a possible reduction in the sugar beet acreage for the campaign of 1918–19, owing to the competition of more lucrative crops and high costs of labor and materials, Mr. Hoover sent the following circular letter to all sugar beet farmers, dated October 22, 1917:

> One of the most vital problems confronting the nation is that of procuring sufficient sugar to meet the requirements of our people and of the Allied Nations fighting our common battle. The production of cane sugar in this hemisphere can and will be increased to a limited

degree. But we must rely upon the farmers in sugar beet producing sections of the country for a part of the needed supply. I, therefore, earnestly appeal to every farmer, so situated, to come to his country's aid in this hour of need. Without the co-operation of the American beet grower our task will be very difficult and our ability to respond to the calls to be made upon us for this very essential commodity will be curtailed. It is at least the duty of every beet grower to maintain in 1918 his normal acreage of sugar beets. It is his privilege to increase the acreage to the extent that a well balanced production of crops will permit, and in this manner effectively demonstrate his patriotism. — HERBERT HOOVER.

It developed, however, that the beet farmers in the West were refusing to sign the customary contracts for acreage with the beet sugar companies because they felt themselves unjustly treated with regard to prices. Moreover, their costs of production were mounting rapidly, competing crops were becoming more profitable, and there was a feeling that with a price restricted by agreement between the sugar factories and the government, the raising of beets would become progressively less profitable in comparison with the production of other food commodities, the prices for which were not regulated by the government. Mr. Hoover thereupon appointed local commissions in the principal beet-growing states to investigate costs of production and he further urged the beet sugar companies to abide by the decisions of these commissions, promising these companies that if they would do so, the government in turn would undertake, in so far as it was able, to readjust prices for the sugar made from these higher cost beets so as to cover the increased outlay involved.

These commissions summoned witnesses and conducted exhaustive examinations in the various states, later submitting reports to Mr. Hoover. The stenographic reports [1] of the California hearings alone con-

[1] These original reports are in the files of the Food Administration. Abstracts of the California and Colorado reports were prepared and issued in the form of mimeographed bulletins.

sisted of nine thick volumes of typewritten ma
testimony of nearly one hundred growers of sug
from the various sections of California having t
bodied. In this state, the hearings began at Los
California, on February 5, 1918, and ended at S
on February 21, 1918. This commission sugg
Mr. Hoover [1] " that the price for sugar beets, sl
on a basis of $8.25 per ton for fifteen per cent b
price to increase or decrease one-fifteenth for e
per cent the sugar content increased or decrea
the price also to increase or decrease a dollar a
each cent the price of sugar increased or decreas
or below seven and one-half cents per pound."

The Colorado Commission began its investig
Longmont, February 13, 1918 and reported
Hoover on March 6, 1918. The following extr
the report gives the general conclusions of th
mission:

Your Commission recommends as a final price recomm
a minimum of $9.00 per ton on a sliding scale basis which
$9.00 per ton for sugar beets testing over 12 and under 14
and which advances the price at the proportionate value o
the minimum price when the analysis shows a percentag
above this fixed minimum at the rate of 64 cents for eac
cent or 32 cents for each one-half per cent above that mini
which shall decrease the price at the same rate below t
minimum where the analysis runs under 12 per cent.

[1] From the Report of the Federal Sugar Beet Commission of Calif
Hoover, p. 8. This report contains much valuable information. The pri
of interest brought out in the testimony are as follows:

1. The sugar beet crop requires considerably more labor, care and at
most other annual crops.

2. A large portion of the labor, particularly the thinning and topping
cannot be done by the farmer or his family even on small acreages.

3. Soils of varying grades of fertility are utilised for beet culture but in
the poorer lands are utilised and these lands are benefited thereby.

4. In 1917 the total average working cost per acre in California inclu
and depreciation on equipment, amounted to $50.80. Interest, taxes, supe
averaged about $33.00 per acre, so that the total cost was about $84.00 p
Colorado the average cost was about $92.00 per acre.

5. A large portion of the land generally utilised for beet growing in Cali
devoted to growing beans. In 1917 large profits were made by the produc
altho the growing of beans involved much less care and risk than the grow

We do not consider a flat rate equitable, altho farmers generally favor the flat rate. If your Administration decides, however, that a flat rate would meet the extraordinary circumstances better than an equitable sliding scale, we recommend $10.00 as the figure to control that flat rate.

The Nebraska Commission was appointed March 5, 1918 and reported to Mr. Hoover on April 6, 1918 as follows:

The cost of producing sugar beets has increased very rapidly, but the price paid for beets has increased less than has the price paid for hay and cereals. To meet this high cost and stimulate beet production, your Commission recommends that the growers be paid $10.00 per ton at the dump for beets, except in those areas located at some distance from the factory where the cost of production was shown to be lower than the average cost, where we recommend a price not less than $9.50 per ton.

The beet sugar factories agreed to abide by the decisions of these commissions and there is definite evidence that they carried out their promises. The Department of Agriculture reports the following average prices paid farmers for beets in 1918 in the various states as compared with other years:

AVERAGE PRICE PAID FOR BEETS PER TON[1]

State	1918	1917	1916
California	$9.95	$7.60	$6.30
Colorado	10.02	7.28	6.06
Idaho	10.00	7.06	6.16
Michigan	10.08	8.04	6.14
Nebraska	9.96	7.22	..
Ohio	10.03	7.18	6.83
Utah	10.01	7.04	5.73
Wisconsin	10.00	8.81	..
Others	9.86	7.28	6.18
United States	10.00	7.39	6.12

The percentage of increase for the United States as a whole, in the price paid the farmers for beets in 1918, as compared with 1917, was thus 35.3 per cent. This increase in the price of beets was of course reflected in

[1] From Crop Reporter, April, 1919, p. 38 and April, 1918, p. 41.

higher costs for the beet sugar factories and the outlay for beets represented 58.2 per cent of the total cost of sugar production in the years 1919 through 1914. Moreover, the cost of all other materials used in sugar production and the wages of labor had also increased rapidly.

The Tariff Commission coöperated actively with the Food Administration in seeking to determine as far as possible the actual increase in costs. The results of the investigations carried on at that time have been incorporated in part in a bulletin published recently by the Tariff Commission. In this bulletin the Commission made the following pertinent comment relative to increasing costs: [1]

There has been a substantial advance in the prices of all the principal items entering into the production of sugar. Prices were higher for the season 1917–18 than before the war and higher for the season 1918–19 than for 1917–18. The greatest percentage advance is shown in textiles, 231 per cent for bags and 256 per cent for filter cloth. Such high percentage advances, however, add less to the cost of sugar than items such as labor, which show a lower percentage advance but are relatively more important. A rise of 200 per cent in filter cloth would add about $1.30 to the cost of a ton of sugar in 1918–19 above the cost of 1917–18, while an increase of only 40 per cent in the wages of factory labor alone would add over $3 and if the rise extended to agricultural labor, as manifested by the increased cost of beets, the increased cost of a ton of sugar would be over $12.[2]

[1] Costs of Production in the Sugar Industry, Tariff Information Series, No. 9, p. 31.

[2] On p. 31 of the pamphlet referred to above a table is presented showing percentage rates of increase for wages and prices of sundry items used in sugar production. These figures, however, represent averages for ten firms only. The following figures compiled by the Statistical Division of the Food Administration show the average percentages of increase in the various items of cost for all the firms reporting each item:

Item reported	Number of firms reporting	Average per cent of increase, 1917 over 1916	Average per cent of increase, 1918 over 1917
Beets	42	22.4	34.0
Labor	48	12.9	22.6
Transportation	20	.3	52.9
Coal	34	61.5	13.4
Coke	18	57.6	18.1
Lime or limerock	40	8.4	15.4
Bags	42	21.1	147.4
Barrels	15	12.2	71.4
Filter cloth	13	31.3	184.1

On the basis of the data submitted by the producers to the Tariff Commission and the Food Administration it was possible to compute the probable cost of producing a ton of sugar for the campaign of 1918–19 [1] for each producer and it was possible to prepare cost line curves showing the relative importance in sugar production of the low and high cost producers.

Such analysis revealed the following situation:

1. A price of 11½ cents per pound for seaboard refined sugar would have been essential to cover all producers and yield a profit of a cent a pound to the high cost producers.

2. Nine cents a pound would have been essential to cover approximately 85 per cent of the production and yield a profit of a cent a pound to the high cost producers of the group.

3. The preceding year's price, 7.45 cents a pound, would have covered but 30 per cent of the production yielding a profit of 1 cent per pound to the high cost producer.

It was therefore necessary that a price of at least 9 cents a pound for refined sugar be agreed upon if the

[1] The following table (p. 32 of Tariff Information Series, No. 9, Costs of Production in the Sugar Industry) shows the manner in which this computation was made.

Items	Cost per ton of sugar 1917–18 averages by		Percentage increase price, rate, or wage, 1918–19 over 1917–18	Estimated cost per ton of sugar in 1918–19 averages by	
	factories	tonnage		factories	tonnage
Beets	$80.04	$67.81	34.0	$107.25	$90.86
Factory labor	12.04	7.86	22.6	14.76	9.64
Coal	7.60	5.05	13.4	8.62	5.73
Coke	1.02	.68	18.1	1.20	.80
Lime or limerock	1.97	1.73	15.4	2.27	2.00
Bags	2.24	2.11	138.7	5.35	5.04
Barrels	1.37	1.28	76.4	2.42	2.26
Filter cloth	.64	.64	184.1	1.82	1.82
Other supplies	3.95	2.89	16.2	4.59	3.36
General expenses	1.22	1.22	31.4	1.60	1.60
Transportation	4.73	6.39	52.9	7.23	9.77
Total	116.82	97.66	....	157.11	132.86

The figures in the above table show the tremendous increase which was anticipated in the cost of sugar production for the campaign of 1918–19 over the previous campaign.

beet sugar production was to be maintained. I
that relatively high price it was clear that ma
tories would face a loss, but, on the other hand
to be reasonably expected that a decreased pro
from this source would be counterbalanced by
creased production of the lower cost firms owin
stimulation of a profitable price.

The domestic cane sugar producers of Louisia
in much the same situation. Figures submitted
Tariff Commission and the Food Administrat
the Louisiana producers showed the following si
there: [1]

Cost — cents per pound (Value of molasses deducted)	Per cent of total production sugar produced under each c	
	Campaign of 1917–18	Anti for 19
5 cents	11.7	
5½ "	14.1	
6 "	34.6	1
6½ "	61.2	2
7 "	86.4	3
7½ "	95.8	4
8 "	96.4	5
8½ "	98.3	7
9 "	99.4	9
9½ "	99.4	9

While the above figures show the cost of sugar p
tion to be rather high for Louisiana, it must be r
bered that the greatest part of the sugar produ
that part of the country is suitable for direct co
tion and commands a price almost equal to that
refiners' standard grade of granulated sugar. T
figures above, therefore, are more comparable w
beet sugar producers' costs, rather than with t
waiian or Cuban cane producers' figures.

It was therefore clear from the figures submitt
a large proportion of the Louisiana sugar industr

[1] These figures were compiled by the writer from two sets of schedules su
the Louisiana producers, one set having been submitted to the Tariff Comm
other set to the Statistical Division of the Food Administration.

not be maintained on a price basis of less than 10 cents per pound for refined sugar.[1]

Investigation made by the Tariff Commission of the Hawaiian cost situation revealed a situation generally similar to the situation obtaining in the continental United States.

In contrast, however, with these high costs in the domestic industry was the condition in Cuba. Here too costs were mounting but they were not as high in the United States. The mission from the Republic of Cuba appointed by President Menocal to negotiate a price for the 1918–19 crop, submitted a brief to the Food Administration relative to the costs of production and the price for the 1918–19 crop, in which it was stated that the average cost per pound of sugar in 1916–17 for firms representing a production of 946,146 short tons or 31.28 per cent of the total crop of that year was 3.355 cents, whereas in 1917–18, the cost per pound for firms representing a production of 1,037,318 short tons or 30.1 per cent of the total crop had mounted to 3.88 cents, an increase of .525 cents per pound. The Mission stated that a price of 5.60 cents f. o. b. at the north ports of Cuba and 5.55 cents f. o. b. at the south ports would be required to sustain and to stimulate the production of sugar for the 1918–19 crop, as compared with the 4.60 cents at the north ports of Cuba and 4.55 cents at the south ports for the previous crop. The Mission thus apparently anticipated an average increase of about 1 cent per pound in the cost of sugar production in Cuba for 1919 as compared with 1918.

The price situation, as it appeared in June, 1918, may be summarized as follows:

[1] That is to say, it was anticipated that about 10 per cent of the production for 1918–19 would be produced at a cost over 9 cents per pound. A basic price of 10 cents per pound would thus be required in order to give these producers a profit of one cent per pound.

1. Cuba, which normally supplied the United States with 49.8 per cent [1] of the total annual supply, requested a basic price for raw sugar of 5.55 cents per hundred pounds f. o. b. Cuba. This price was considered sufficient to stimulate production in Cuba.

2. The domestic beet sugar industry which supplied 15.97 per cent [1] of the total annual consumption of the United States required a basic price of at least 9 cents per pound for refined sugar to maintain production.

3. The domestic cane industry in Louisiana, which supplied 6.27 per cent [1] of the total annual consumption of the United States required a basic price for refined sugar of about 10 cents per pound to maintain the production.

4. The Hawaiian industry which supplied 13.66 per cent [1] of the total annual consumption required about the same price as the domestic beet industry.

If the price of sugar was to be raised only sufficiently to meet the needs of the Cuban producers, the resulting basic wholesale price for refined sugar at seaboard refining points would have been 8.54 cents per pound. The difference between 8.54 cents and the 5.55 cents paid to the Cubans for raw sugar would have been made up as given in the table on the next page.

Between the above price of $8.54 per 100 pounds for the refined Cuban sugar at seaboard points and the basic net cash price of $8.82 [2] desired for the domestic beet sugar there was a differential of 28 cents per 100 pounds. The dilemma confronting the Food Administration was either to advance the price of sugar in the United States to 8.82 cents,[2] thus covering the needs of the domestic industry, but giving the Cubans 28 cents a 100 pounds more than they had asserted was essential to maintain

[1] Average for years 1911–12 through 1914–15, compiled from figures on p. 446 of The Cane Sugar Industry, Miscellaneous Series, No. 53, of Department of Commerce.

[2] The list price of 9.00 less 2 per cent for cash.

Basic price for 96° test centrifugal sugar f. o. b. Cuba per 100 lbs.	$5.55
Duty, freight, and insurance	1.45
Refiners' existing margin (net cash basis)	1.30
Probable increase in refiners' margin essential to meet increased cost of refining [1]	.15
Plus 7 per cent of increased price of raws [2] to refiners	.09
Basic (net cash) wholesale price for refined sugar per 100 lbs.	$8.54

and stimulate the Cuban production, or disregarding the previous promise to the domestic industry to advance the price only to $8.54, the point where the Cuban production would be maintained.

There were two objections to the first plan — the fixing of a price of 8.82 cents:

1. It would have involved the payment to Cuba by the people of the United States of about $18,000,000 more than was essential to maintain the Cuban production during 1919.

2. The Allies, particularly the United Kingdom, who wished to buy about one-third of the Cuban crop to meet their needs, as they had done in the previous year, strongly objected to making this unnecessary payment to Cuba.

There were, on the other hand, several objections to the second plan — the fixing of a price of 8.54 cents:

1. The Food Administration, as explained above, had assured the beet sugar producers that if they would abide by the recommendations of the various state commissions relative to the prices to be paid farmers for beets, the Food Administration would undertake, so far

[1] Not only were producers' costs mounting but refiners' costs as well. The refiners had complained to the Food Administration early in the year that the increased cost of labor and supplies made it essential that the margin determined upon in October, 1917 be changed. Mr. Hoover thereupon appointed Mr. Oscar S. Straus, Chairman of the Public Service Commission in New York, to investigate the claims of the refiners. An increase of about 15 cents per hundred pounds seemed essential in view of the change in conditions since October, 1917.

[2] Required to cover the 7 per cent loss of sugar in the melting process.

as it was able, to obtain for them a fair price for the sugar made from these beets. As the figures indicated above show there was no question that the beet sugar producers had done as requested and the Food Administration in turn was under obligations to maintain its previous promise.

2. The lower price would have had a tendency to discourage the domestic sugar production, every ton of which saved an equivalent amount of shipping tonnage. The importance of the domestic industry was emphasized in June by the sudden appearance on the Atlantic coast of German submarines which sank 13,000 tons of sugar in a few days.

The problem might have been solved by the imposition of an additional import duty on foreign sugars equal to the difference of 28 cents in the costs of production. To this policy there were two objections:

1. New legislation would have been necessary to effect this change and such legislation might have involved contention and delay when immediate action was essential.

2. There was a possibility of bringing sugar to the United States from Java in the Dutch ships, negotiations for which were pending in June, 1918 and this sugar, in view of the high cost of transportation might have been excluded by such an additional duty.

The one practical solution was the creation of a sugar commission, such as Mr. Hoover had suggested to the Senate Committee on Agriculture in June, 1917, which would purchase sugar in coöperation with the Allies, who already had similar organizations. Such an organization could purchase from Cuba, Java, Peru, or from any foreign source of supply at any price that was desirable with a view to better economy of supplies and shipping for all the Allies, and resell to the American refiners at an average price.

(b) *Problems Relating to Supply and Distribution*

A careful inventory made in the spring of 1918 of the available supplies for the United States for the seven months, June–December, 1918, revealed the strong probability of a sugar shortage. It was of course difficult to foretell exactly the size of the various crops at that early date. Varying weather conditions in Cuba between June and August could easily account for a difference of some 200,000 to 300,000 tons or the equivalent of almost a month's supply for the United States. The estimates for the crop by the experts varied from 3,200,000 long tons [1] to 3,589,429 long tons,[2] and it was of course advisable to use as a basis the most conservative figures. The situation then appeared as follows:

(Quantities in short tons, 000's omitted)

Stock on hand June 1, 1918		298
Raw cane (in refiners' hands)	163	
Beet sugar	85	
Refined cane sugar (in refiners' hands)	50	
	298	
Expected receipts (June 1–Dec. 31, 1918)		1,981
Cuban	954	
Hawaiian	338	
Porto Rican	189	
Domestic cane	150	
Domestic beet	350	
	1,981	
Total stocks and receipts (raw and refined)	...	2,279
Total stocks and receipts (in terms of refined)	...	2,150
Requirements for U. S. consumption in terms of refined sugar on normal basis (June 1–Dec. 31, 1918)		2,616
Deficit considering U. S. consumption only	466	
Deficit considering required minimum exports to Allies of about 200,000 tons	656	

[1] Willett and Gray's estimate.

[2] Estimate of the Cuban statisticians — Messrs. Guma and Mejer.

It was evident then that the margin betwe
available sugar supply and the requirements
United States both for consumption and export
Allies, for the year 1918, would be a narrow one a
This situation was due to three causes, first, the
to restrict the consumption of sugar in the United
by appeal to the public for voluntary conservati
not been sufficiently fruitful; secondly, there
reserve supply of consequence on hand in the
States, either in refineries, mills or warehouses, or
hands of wholesalers, jobbers, and retailers; third
Allies in order to economize shipping were be
increasingly dependent on the western hemisph
their supplies. It will be of importance to consid
of these matters more in detail.

Difficulties in Restriction of Consumption. The
lem of reducing the sugar consumption of the
States was an extremely difficult one. The p
annual per capita consumption of the United Stat
about 83 pounds, as compared with 42 poun
France and 90 pounds for the United Kingdom.
per capita consumption of the United Kingdom i
had been reduced to about 52 pounds while Fran
consuming at the rate of 35 pounds. There was,
fore. considerable room for reduction of sugar con
tion in the United States. But war conditions ten
increased consumption in the United States. F
result of the war had been the increased prosperit
the increased purchasing power of a very large p
the consumers. Sugar is normally used, unlike
other food commodities, as a constituent in many
food products so that the demand for sugar mul
in all directions. Condensed milk, candy, soft d
canned fruits and vegetables, ice cream, fla
extracts, chewing gum, sweet pickles, catsup, chili

baked goods and many other edible products, all require sugar, as also certain non-edible products such as tobacco, dental preparations, drugs, explosives and glycerine. Products such as condensed milk were exported in large quantities to the Allies and the sugar so used was therefore not to be considered as consumed by the people of the United States, but the effect was to create a larger demand for sugar in this country. In addition the armed forces of the United States consumed much more sugar per capita than the civilian population. Considerable amounts were shipped for the Red Cross, Y. M. C. A., Knights of Columbus, and other war organizations.

The Food Administration had endeavored in accordance with its general policy of voluntary conservation in the first and second periods of its control of sugar to combat this tendency towards increased consumption through appeals to the patriotism of the public and of the dealers. There has been a general impression both in and out of the Food Administration that these appeals to patriotism did not result in any saving. The figures available demonstrated, however, that a saving was affected. Consumption remained at the pre-war level when a large increase in consumption would have been anticipated.

Conservation through patriotic appeal alone was not sufficient, however, particularly in view of the probable continuance of the war for another year. It was essential to create some restrictive mechanism, which the Food Administration could count upon as being definitively productive of results whenever quick results were desirable. Any card rationing scheme such as existed in Europe involved a large expense for printing cards for a population of over 100,000,000 [1] and a still greater expense for general supervision and execution.

[1] It was estimated that the printing cost alone would have been $100,000 a month.

It was obvious that to satisfactorily solve the
there was need for the creation of such a corpor
Mr. Hoover had originally suggested which coul
take the problem of sugar distribution and con
pay the expenses of such undertaking through
made in the purchase abroad of the foreign sug
the resale to the American refiners.

The Reserve Stocks. The sugar supply of the
States at any one time consists of these parts: f
" visible " stocks, that is raw and refined sugars
mills, factories, refineries, and bonded warehous
United States; second, the " invisible " sup
sugar held by hotels and restaurants, sugar-usin
tries, jobbers, wholesalers and retailers; thi
sugar available from the current seasonal produ
the various sources of supply, principally Louisi
beet sugar territory of the United States, Cuba,
Porto Rico, and the Philippines. A gradual atte
had occurred during the war in both the " visibl
" invisible " supplies of sugar in the United

[1] The following figures (taken from Willett and Gray's Weekly Stati
Journal, vols. 36–41, for the years up to 1918, and from the records o
national Sugar Committee for 1918) show the decline in refiners' stocks o
at Atlantic ports refineries during the war:

STOCKS OF RAW SUGAR AT ATLANTIC PORTS REFINERIES ON 1ST
MONTH

(LONG TONS RAWS)

Month	1912	1913	1914	1915	1916	1917
January	72,849	45,065	59,934	94,677	65,181	42,190
April	186,569	184,115	157,573	116,137	92,006	274,284
July	190,110	308,767	278,590	256,849	177,436	290,718
October	89,958	155,293	260,343	131,637	94,747	56,028

Beet sugar stocks as reported by the Department of Agriculture (F
vol. ii, Nos. 7 and 17) on July 1, 1918 were 73.6 per cent of the stocks on J
stocks in warehouses on July 1, 1918 were but 30.5 per cent of the stocks on
wholesalers' stocks were but 71.6 per cent, retailers' stocks were but 73
Bakers' stocks were 92.9 per cent and confectioners' stocks were 68.5 per
stocks held on July 1, 1917. Milk condensers and manufacturers of pe
larger stocks on July 1, 1918 than on July 1, 1917. The total stocks of sug
for the United States as a whole on July 1, 1918 were but 67.3 per cent of
on July 1, 1917.

This decline was due to a combination of several factors. First, the shipping situation for the United States had not been such as to encourage the movement of more sugar from Cuba, Hawaii, and Porto Rico than was necessary to meet current needs. Second, the stabilization of prices and profits for all the branches of the sugar industry from refiner to retailer had a strong tendency to discourage larger holdings than was essential for a "hand to mouth" trade. In previous years the speculative factor had induced larger holdings of sugar particularly in those months of the year when there was heavy sugar production in all the sources of supply. During the war, on the other hand, with the price of sugar stabilized and with the prospect of equitable distribution of the available sugar supplies by government control there was no inducement to accumulate stocks. Third, there was a general world shortage of supplies, particularly for Allied and neutral countries, and this shortage forced reduced surplus holdings in all importing countries.

In view of this reduction in marginal supplies the Food Administration was constantly in fear of a sugar famine if there should be any interruption in the continuous flow of sugar to the United States from Cuba, Hawaii, or Porto Rico. Moreover there was always the possibility of labor disturbances in the sources of supply or in the ports of the United States. It was felt that it was necessary to provide the United States with a reserve supply of at least two months requirements of sugar or about 600,000 tons.[1] Such an undertaking, however, required large financial resources and could not properly be managed by the existing agencies in the Food Administration.

[1] The Food Administration was influenced in this direction by the example of the British Ministry of Food which had accumulated 271,000 long tons of sugar on June 1, 1918 as against only 30,000 tons on June 1, 1917 and 243,406 tons, the pre-war average for June 1.

The Sugar Position of the Allies. As the war continued the Allies turned in increasing degree to the United States and Cuba for supplies of sugar. The following figures show to what extent this was true:

IMPORTS INTO THE UNITED KINGDOM, FRANCE, AND ITALY FROM THE UNITED STATES AND CUBA

(Quantities in short tons)

	1913	1914	1915	1916	1917
Imports from United States (mostly refined)					
To United Kingdom	....	141,602	211,346	187,803	42,534
France	....	978	210,648	275,644	232,736
Italy	....	....	....	32,830	20,962
	....	142,580	421,994	496,277	296,232
Imports from Cuba (mostly raws)					
To United Kingdom	251,134	293,290	402,915	619,992	789,032
France	21,382	37,636	6,801	120,196	61,343
Italy	....	....	....	6,285	3,823
	272,516	330,926	409,716	746,473	854,098
Total imports from United States and Cuba — into United Kingdom, France and Italy	272,516	473,506	831,710	1,242,750	1,150,330

While the production of sugar in Cuba and the United States had increased considerably in this same period there had been a simultaneous increase [1] in consumption in the United States which partially neutralized this gain in production.

The net result of the operation of the several factors noted was to leave a smaller margin of supplies for the United States for domestic use in 1917 than was present in 1913. But in 1918 the drain from the Allies was to be even greater, since the United States Food Administration acting in coöperation with the Allied governments had purchased in December, 1917 the entire Cuban exportable surplus for the United States and Allies, a full third of which, or approximately 1,150,000 short

[1] This increase in production amounted to about 1,049,000 short tons while the increase in consumption amounted to about 225,000 short tons of refined sugar. The requirements of the United Kingdom, France and Italy from the United States and Cuba increased 877,000 tons in this period.

tons, was to go to the United Kingdom, France, and Italy. When the contract was made in December, 1917 it was believed that the needs of the Allies would be met fully by this allotment together with other minor sources of supply which they could tap. The great effort, however, put forth by the United States and the Allies in 1918 did not tolerate any waste of shipping and it was found in June that, assuming a Cuban exportable surplus of 3,472,000 short tons, at least an additional 112,000 tons of refined sugar would be required in order to maintain the meagre rations of the Allies and to prevent their recourse to distant markets such as Java.

So much then for the problems facing the Food Administration in connection with the 1918–19 crops. Solution of the price problems was required immediately since beet sugar made from the new crops was about to enter the market. The problems relating to supply and distribution were even more pressing since a severe sugar shortage was threatening. The following pages discuss the manner in which these two sets of problems were met.

III. The Solution of these Problems through the Formation of the United States Equalization Board

(a) *Formation of the Board*

As has been suggested above, the problems facing the Food Administration, relative to both prices and distribution, were capable of satisfactory solution only by the creation of government sugar corporation for which the Grain Corporation supplied a precedent. The Food Administration itself, having no authority under the

Food Control Act to buy sugar, recourse to the President's war emergency powers and funds was necessary. The corporation was created by authorization from the President of the United States who set aside $5,000,000 for the purchase of the capital stock of the corporation out of his emergency fund of $50,000,000, provided in the "Sundry Civil Act" of July 1, 1918. The Board was incorporated July 11, 1918 in the state of Delaware and the first meeting of the Board of Directors took place on July 18, 1918.

On July 11, 1918 the Food Administration issued the following notice:[1]

The President has approved the formation of a sugar equalization board by the Food Administration. The Board is to be composed of: Herbert Hoover, chairman; George M. Rolph, president; Directors: Professor F. W. Taussig, of the United States Tariff Commission; Theodore F. Whitmarsh, George A. Zabriskie of the Food Administration; Clarence Woolley of the War Trade Board; William A. Glasgow, Jr., Chief Counsel of the Food Administration. The office of the Board will be in Washington.

The purposes of the Board are to equalize the cost of various sugars and secure the better distribution. The arrangements will facilitate joint dealing with the Allies in foreign sugars and the adjustments of differentials in overseas freight rates. Under certain circumstances, it may be advisable to acquire the production of some beet sugar factories that cannot under the present price of beets be sold to the public at a reasonable price. The Board will take charge of the distribution plan initiated on July 1, and will conduct this plan at the expense of the Board. The Board will be incorporated to the extent of $5,000,000 of capital which will be supplied by the President from his special funds, in order to enable it to deal with facility in foreign sugars and otherwise and the whole stock will be held by the President for the United States Government. The object is to absorb the high peaks of cost in sugar production and to make a small margin on the low cost of certain foreign sugars which may be purchased and thus secure an equalization of the price to the public on a lower level than will otherwise be possible. The arrangements will further secure an even distribution of the sugar throughout the United States. It is expected that any profit will be equalized to the consumer over the year's operations.

[1] News Release, No. 1061.

With the formation of the Sugar Equalization Board, the sugar problem, as such, was practically solved, at least from the viewpoint of the Food Administration, since there had been created a responsible body, the function of which was the determination of general policies in relation to the various problems which might arise. Moreover, with the capital stock of $5,000,000 supplied by the President as a basis for financial operations, with the further possibility of obtaining a margin of profit on the import of foreign sugars throughout the crop year, the corporation could relieve the Food Administration of the large expense involved in the proper control of an equitable distribution.

(b) *The Solution of the Price Problem*

The directors of the Sugar Equalization Board began action looking towards an agreement on the price of sugar for 1919 by hearing the representatives of the various sugar producers. The Cuban Mission appeared before the directors of the Board on August 9 and maintained their position as previously presented to the Food Administration that a price of $5.60 per 100 pounds was essential in order to yield a fair profit to the Cuban producer. The majority opinion of the directors of the Board was that $5.25 per 100 pounds would be sufficient. No agreement was possible on this basis, and the Cuban Mission was asked to report to the Cuban government for further instructions. On the same day there appeared the representatives of the beet sugar manufacturers who presented figures of costs and requested a price for refined sugar at seaboard points of not less than 9 cents per pound. On the following day the representatives of the Hawaiian producers came before the Board, submitting cost figures and urging

that the price of their raw sugar be fixed at not less than 7 cents per pound, but recommending that the price be fixed at 7½ cents. On August 16, the directors heard the Louisiana producers who urged that the price of raw sugar be fixed at not less than 8 cents per pound.[1]

These hearings only served to emphasize what had already been made clear by the cost investigations made by the Food Administration and the Tariff Commission. The Cuban price of 5.60 cents per pound f. o. b. Cuban ports reflected a basic price for raw sugar of only 7.05 cents per 100 pounds at seaboard refining points after freight, insurance and duty were added. The resulting basic price for granulated sugar, after adding the refining margin of 1.54 cents,[2] would have been 8.59 cents. The price of 7.05 cents for raw sugars might have been satisfactory to the Hawaiians who had asked for a minimum price of 7 cents per pound, altho they had urged a price of 7.50 cents to maintain production, but would not have been satisfactory to the Louisiana producers who had requested a price of 8 cents per pound for their raw sugar. The price for refined sugar of 8.59 cents would have been unsatisfactory to the beet sugar producers who had asked for 8.82 cents.[3]

After some further negotiations with the Cuban Mission an agreement was reached. The contract was closed on September 13, 1918, the price being $5.50 per 100 pounds f. o. b. Cuban ports. The Food Administration announced that the purchase had been made on behalf of the American, English, French, and Italian governments, a departure from the preceding year's contract when the purchase was made jointly by the

[1] The Porto Ricans did not send representatives to Washington since they felt that any price basis established which would be suitable for the beet sugar or Hawaiian industry would be suitable also for the Porto Rican industry.

[2] Net cash basis.

[3] Ibid.

United States and Allies acting through the International Sugar Committee.

While the negotiations were being conducted with the Cubans, the question of the refiners' margin was also being taken up. The report of Mr. Oscar Straus, who had been appointed by Mr. Hoover earlier in the year to investigate the cost of refining, was submitted to the Board as a basis for a decision. Mr. Straus had reported as follows:

1. That the $1.30 margin in existence from January 1 to July 1, 1918 gave a fair and adequate profit.

2. That "if conditions should remain the same for the remainder of the year no additional margin would be justified, but that the possibilities of lack of raw sugar, increase of wages, and in cost of materials, fuel, and containers would have a bearing on the proper decision."

3. "That since he could not decide upon the probability of these contingencies he referred the settlement of this matter to the Food Administration." [1]

The Board examined the figures submitted of increasing costs of labor and materials and of the probable amount of raw sugar available for melting in the period August 1, 1918–December 31, 1918. It was estimated that the amount of raw sugar available for refining for this period would be 813,676 long tons, an average of 162,735 long tons per month, as against a total of 2,138,954 tons or an average of 305,565 long tons per month for the period January 1–August 1, 1918. As matters actually developed, the amount refined in the period was 947,128 tons which was 133,452 tons above the estimate [2] but still much below the average of the first seven months of the year. The Board decided that an increase

[1] News Release, No. 1151, August 25, 1918.

[2] This increase over the estimate is accounted for by the final outturn of the Cuban crop, which was 3,444,605 long tons against Willett and Gray's estimate of 3,200,000 long tons.

in margin was justified and on August 25th, the Food Administration announced that, dating retroactively from August 1st, the new margin would be $1.45 per 100 pounds.

With the price for new Cuban crop sugars and the refiners' margin decided upon, a minimum basic price for sugar was thus established, since the new Cuban price with duty, freight, and insurance added plus the new refiners' margin would net a price for refined sugar at seaboard points of 8.49 cents. This price would, of course, have been unsatisfactory to the domestic producers, beet and cane, since this price was 33 cents per 100 pounds below the price requested by the beet sugar producers, and $1.05 per 100 pounds below the price requested by the cane producers. Moreover, on the 8.49 basis there would have been no differential accruing to the Board for financing the distribution of sugar.

Accordingly the Board decided to adopt a basis of 9 cents for refined sugar for the whole country (8.82 net cash); the differential of 33 cents per 100 pounds on foreign sugars to be turned over to the treasury of the Equalization Board. The whole plan was then as follows:

Basic price for refined sugar, cane and beet, 9 cents per pound	8.82 cents net cash
Refiners' margin	1.54
Basic price for all raw sugars, paid to the Board by refiners	7.28
Margin to the Board	.33 [1]
Cost of raw sugar to the Board	6.95
Freight, insurance, and duty	1.45
Basic price of Cuban sugars f. o. b. Cuba	5.50

[1] As it actually turned out in 1919, the margin was increased to 38 cents owing to the elimination of the war risk insurance of 5 cents per hundred pounds.

It is of interest to compare, as in the following table, the various prices actually obtained by the producers in the different sources of supply with the prices they had originally requested and with the prices in effect the preceding year:

Source of supply	Per cent of total pre-war consumption of U. S. supplied by each source of supply	Basic prices requested (in cents per pound)	Basic prices actually obtained (in cents per pound)	Basic prices in effect preceding year (in cents per pound)
Cuba (raw sugar)	49.8	5.55	5.50	4.55
Hawaii (raw sugar)	13.66	7–7.5	7.28	6.005 [1]
Porto Rico (raw sugar) ...	8.01	7–7.5 [2]	7.28	6.005 [1]
Louisiana (raw sugar)	6.27	8	7.28	6.35
United States beet (refined sugar)	15.97	9	9	7.30

The only remaining problem was to find a suitable date for putting the new scheme into operation. Since the new crop of Cuban sugars would not be available till December there was sufficient time to work out all details of the agreement with the Cubans. But the new beet sugar was already available in the West and it was essential, particularly in view of the scant supplies in the country, to make an agreement with the beet sugar producers in order that the 1918–19 crop might be freely available for distribution. Obviously, until this agreement was reached and the new price basis established, beet sugar producers could not ship their sugars. To put the new price into operation immediately involved having the " new domestic crop at the new price and the old foreign crop at the old price in the market at the

[1] This price was increased to 6.055 on June 24, 1918 owing to the increased cost of war risk insurance.

[2] No special price was requested but it was generally understood that the Porto Rican producers were well satisfied with the price requested by the Hawaiians.

same time." [1] To avoid this the Board decided to purchase all sugars in the refineries and cane and beet sugar mills of the United States, including all sugars in process or in transit, at the old price of 6.055 cents per pound for raw sugar and 7.35 cents for refined sugar and immediately to resell these sugars to the holders at the new price of 7.28 cents for raw sugars and 8.82 cents for refined sugars. The refiners were to be allowed the increased margin of 15 cents on all sugars delivered and invoiced from August 1st to the date when the new price was to go in effect. Through this device, the profit which would otherwise have been made by the refiners and beet sugar producers through purchase at the old price and sale on the basis of the new price, was to be absorbed by the Sugar Equalization Board. The date of this change was to be announced at a future date. On September 6, 1918, the Food Administration announced that the change would become effective on Monday morning, September 9. Wholesalers and retailers were warned not to average their prices but to sell upon the old basis until their stocks of the lower priced sugars were exhausted. From September 9 till the end of the year, the refiners purchased all their sugars from the Sugar Equalization Board at a price of 7.28 cents per pound. The Board absorbed the differential of 1.225 cents per pound between this price and the 6.055 cents per pound, the duty paid price for raw sugars of the 1917–18 crop.

As a result of these various activities, the Board drew revenue from three general sources:

1. It obtained a differential between the old and new price on the refiners' and beet sugar manufacturers' inventory of raw and refined sugar of September 9, 1918.

[1] News Release, No. 1151, August 25, 1918.

2. It obtained a differential between the old and new price on all arrivals of old crop cane sugars after September 9, 1918.

3. It obtained a differential of 38 cents [1] on all new crop foreign sugars (which began to arrive in December, 1918) between the duty paid price of $6.90 per 100 pounds for Cuban raws and the price to refiners of $7.28.

The revenue account of the Board on October 15, 1918 was as follows: [2]

UNITED STATES SUGAR EQUALIZATION BOARD, INC., REVENUE ACCOUNT

(from July 1 to October 15, 1918)

By cane sugar sales		$35,611,235.00
By beet sugar sales		3,095,011.66
		$38,706,246.66
Less		
Cane sugar purchases	$30,471,995.79	
Refunds on shipments to Allies under old contract	626,947.66	
Beet sugar purchases	2,579,176.37	33,678,119.82
		$5,028,126.84
By bank interest received		18,536.84
		$5,046,663.68
To salaries — general office	$5,302.07	
To salaries — federal food boards	219,616.70	
To office — general office	3,042.03	
To office expenses — federal food boards	95,543.13	322,503.93
Net income transferred to balance sheet		$4,724,159.75

[1] See footnote, p. 698 for explanation of change from 33 cents to 38 cents.

[2] From the official statement of the United States Food Administration, November 1, 1918, No. 6, p. 18.

(c) *The Agreements with the Producers and Refiners*

Once having disposed of the price problem the road was cleared for the execution of agreements with the various producers. The agreement entered into on October 24, 1918 between the Sugar Equalization Board, the Cuban Commission, and the agents of the Cuban producers contained the following provisions:

1. Sugars were to be purchased for shipment to the United States at the price of 5.88 cents [1] per pound "cost and freight," to New York or Philadelphia.

2. Sugars were to be purchased for shipment to the United Kingdom, France, and Italy at a price of 5.50 cents per pound f. o. b. northern ports or 5.45 cents per pound f. o. b. southern ports.

3. Shipments of sugar were to be made immediately after the beginning of the crop, not less than 2 per cent of the amount to be shipped on December, 1918 and the remainder in approximately equal monthly shipments from January to November, 1919.

4. Provisions were made in the agreement for brokerage, marine insurance, lighterage and so forth.

On September 18, 1918 an agreement with each individual beet sugar producer was entered into by Mr. Herbert Hoover, the United States Food Administrator, as had been done in the previous year. The main provisions of these uniform agreements were as follows:

1. A central "Sugar Distributing Committee" was created to "direct the distribution of the beet sugar crop in the most economical and efficient method consistent

[1] This price was based on the freight of .38½ cents per 100 pounds from north side ports, west of and including Caibarien, to New York or Philadelphia. The differentials between this freight rate and the rate to Boston or southern ports were to be added to or subtracted from the basic price of 5.88 cents.

with an equitable distribution of sugar where needed throughout the United States." [1]

2. Every producer agreed to abide by the rules and directions of the Sugar Distributing Committee and to sell at a price not to exceed the basic maximum price of 9 cents per pound at seaboard refining points.

3. The Sugar Distributing Committee was empowered to make a final settlement to individual producers at the close of the crop, based on the " average net proceeds per pound of sugar resulting from the sale of all sugars" [2] of the 1918–19 crop.

An agreement of the same character as that with the beet producers was entered into by the Food Administrator and the Louisiana cane sugar producers. A committee called the Louisiana Sugar Committee was created to direct the distribution of Louisiana sugar, under the supervision of the Food Administration. The basic price for raw sugar at customary Louisiana refining points was not to be " greater than the price which may be found to be just and fair by the United States Food Administrator and not less than the price of duty paid 96 degree Cuban raw sugar delivered at such refining points." [3] The minimum basic price for Louisiana raws was thus established at 7.28 cents per pound. The basic price for Louisiana refined sugar was to be the price determined by the Food Administrator " under provisions of his uniform contracts with the sugar refiners of the United States, dated October 1, 1917." [4] For the Louisiana crop of 1918–19 this arrangement meant a basic net cash price of 8.82 cents per pound.

[1] Agreement with the United States Food Administration as to Sale and Distribution of Beet Sugar Crop, 1918–19, p. 6.

[2] Ibid., p. 5.

[3] Agreement with the United States Food Administration as to Louisiana Sugars, p. 5.

[4] Ibid., p. 3.

Price differentials were established in the agreement for the many different grades of so-called "direct consumption" sugars manufactured in Louisiana.

An agreement [1] dated October 24, 1918 was entered into between the Equalization Board, the refiners of the United States, and the Food Administrator, the chief provisions of which were as follows:

1. The refiners agreed not to purchase any sugar for delivery during 1919, except from the Equalization Board.[2]

2. The allocation of sugar to the different refineries was to be based on a percentage scale which was incorporated in the agreement.

3. An "American Refiners' Committee" was created to direct the distribution to the refineries of the sugar obtained by the Equalization Board.

4. The refiners agreed to sell all their refined sugar at a price not to exceed 1.54 cents per pound above the price paid for raw sugar to the Equalization Board.

5. The Equalization Board agreed to supply the refiners with their requirements of raw sugar for 1919 at a price of 7.28 cents a pound.

6. In event of a decrease in the price of sugar in 1919 the Board agreed to pay the refiners the amount of their loss; in the event of an increase in the price of sugar, the refiners agreed to pay the Board the amount of their gain.

[1] The Federal Sugar Refining Co. felt that this contract with the refiners might constitute a violation of the Sherman Anti-Trust Act. The Food Administration therefore requested the opinion of the Attorney-General who, in a statement issued January 9, 1918, upheld the legality of the contract.

[2] Except such sugars of the 1917–18 crop as were provided for under the agreement of the previous year and Hawaiian sugars contracted for by some of the eastern refineries.

(d) *Solution of the Problems Relating to Supply and Distribution*

The Food Administration began activities aiming at an effective control of distribution in the spring at 1918. On May 4, it announced [1] that all manufacturers using sugar, with the exception of those making essential food products,[2] were to be restricted to 80 per cent of the preceding year's requirements. Manufacturers who began business or enlarged their capacity after April 1, 1918, also all manufacturers of non-edible products with certain exceptions,[3] were to receive no allowances of sugar. The restrictions were to be made effective through the use of a certificate system controlled by the federal Food Administrators of each state who were to issue certificates to all manufacturers upon receipt of sworn statement as to requirements. No sugar manufacturer or distributor was to deliver sugar to any one without first receiving certificates. All these regulations were to apply to the period from May 15 to July 1. On June 1, 1918, the Food Administration announced [4] "that manufacturers who now have on hand sugar that, when added to the amount already used this year, will bring their quotas above 80 per cent of the amount used from January to July, 1917, must turn over the excess to their administrators at once, or be prosecuted as hoarders."

The second step in the process of obtaining control over sugar consumption was the division of all users of sugar into five classes, denoted as A, B, C, D, and E. Class A comprised all non-essential industries. These

[1] News Release, No. 916.

[2] Included under this head were commercial fruit preservers and packers of vegetables, milk condensaries, jam manufacturers, and ice cream manufacturers (to encourage maintenance of milk production).

[3] These exceptions were manufacturers of tobacco, explosives and drugs.

[4] News Release, No. 985.

were to be restricted for the period July 1–September 30 to 50 per cent of their consumption in the corresponding months of 1917.[1] Class B included all the industries using sugar for preserving and canning fruits and vegetables, that is, the essential food industries. These were to be allowed their full needs. Class C included all public eating places regularly serving 25 persons or more. These were to be allowed 3 pounds of sugar for every 90 meals served in the third quarter of 1917.[2] Class D included all manufacturers of baked goods, who were to receive 70 per cent of the 1917 consumption. Finally, Class E included retailers and all dealers selling sugar for direct consumption, who were to be allotted their requirements based on 3 pounds per customer per month. This plan, directed from Washington, was put into operation by the state Food Administrators through the use of certificates. The retail grocer and the other classes of businesses described above received from their state Food Administrators "Sugar Distribution Certificates" of different quantitative denominations covering their sales of sugar to different types of customers. These certificates passed from retailer to wholesaler and from wholesaler to refiner or beet sugar manufacturer, unless, of course, the retailer bought directly from the refiner or manufacturer of sugar. The refiner or manufacturer then returned these certificates to the state Food Administrators who had issued them.

The whole plan thus involved the creation of a clerical staff in each state to attend to the issue and cancellation of certificates and a considerable expense was thus imposed upon the offices of the state Food Administrators. This expense was assumed by the United States Sugar

[1] Manufacturers of milk chocolate, however, could use 75 per cent of the amount of sugar used during the third quarter of 1917 for condensed milk.

[2] The month of June, 1918 could be used as a basis instead of the third quarter of 1917.

Equalization Board when it undertook the control of the entire plan shortly after its incorporation. One of the directors of the Board, Mr. George A. Zabriskie,[1] had already been appointed to take charge of the wholesale and retail sugar distribution for the United States and the Board assumed financial control as well.

The whole scheme under the Board's jurisdiction worked out about as follows:

1. The President of the Board constantly communicated with the Cuban Producers' Committee and with the Allies through the offices of the International Sugar Committee [2] and determined the amount of the Cuban 1917–18 crop available for distribution to the United States after the Allied requirements had been met. From the Statistical Departments of both the International Sugar Committee and the United States Food Administration and from representatives in each locality, he received information as to the amount of sugar available from other than Cuban sources of supply — Porto Rico, Hawaii, Philippines, etc. The Army and Navy, the Red Cross, the Belgian Relief, the Y.M.C.A., Knights of Columbus, and other relief organizations advised him of the amount of sugar they would require and finally the United States Shipping Board advised him of the amount of shipping tonnage that could be utilized to transport sugar to the United States. It was thus possible to approximate the amount available for civilian sugar distribution in the United States for each month.

2. A scheme of equitable allocation to individual states was then worked out based on the population of

[1] Mr. Zabriskie had been in charge of flour distribution and on June 25, 1918 the Food Administration announced that both flour and sugar wholesale and retail distribution would be attended to from his office as the distribution division of the Food Administration.

[2] This was the organisation created in December, 1917 to allocate the 1917–18 Cuban crop among the Allied governments and to the various refiners of the United States.

each state, the normal needs of each state [1] and the normal sugar deliveries into each state.[2]

3. Each state Food Administrator then was notified as to the amount available for distribution for his state each month for all civilian purposes. The details of the distribution within the state under the certificate scheme were left to the discretion of the state Food Administrator.

By virtue of agreements entered into by the Food Administrator with the Louisiana sugar producers and the beet sugar manufacturers, central distributing committees were created to handle the distribution of the new crop domestic sugars under the direction of the Sugar Equalization Board in accordance with requirements for an economic and equitable distribution for the country as a whole, while through the agreement with the cane sugar refiners, the Board was able to direct the movement of sugars leaving the refineries. Thus it was possible to move sugars at any one time from regions of plenty to regions of scarcity, any unusual expenses incurred in such movements being met out of the funds of the corporation. In practical operation it was found essential to divide the country into zones of distribution, each zone being supplied from the nearest and most effective sources of supply.[3]

The scheme as outlined above was extremely effective in the creation of a rigorous yet elastic control over sugar consumption and distribution. The sugar ration for household use and the allowances to the various in-

[1] Including the requirements of its industries as determined from statistical investigation by the state Food Administrators.

[2] As reported by refiners and beet sugar manufacturers to the Food Administration.

[3] The rules and regulations issued from time to time to beet sugar factories, refiners, and Louisiana producers relative to distribution are too many to discuss in detail here. Briefly, however, the general plan was to increase the territory of the beet sugar producers as increased beet sugar supplies became available while at the same time decreasing the territory in which cane sugar refiners or Louisiana producers could sell their sugars, thus husbanding the available supplies in regions of greater relative scarcity.

dustries were changed from time to time as the outlook for available supplies and shipping tonnage changed. Thus for the period from August 1 to November 1 the household ration was fixed at 2 pounds per person per month while for November it was increased to 3 pounds. The signing of the armistice made it unnecessary to continue rigid control and the certificate scheme was abandoned on December 1, 1918. More drastic restrictions of non-essential industries were contemplated from November 1 on, some of which were put into effect for November, but the signing of the armistice rendered such action unnecessary.

Many estimates have been made of the reduction in sugar consumption brought about in the four months of complete control, July–October, 1918, through the plan of restriction outlined above. Such attempts are of little value, first, because there are no accurate or reliable statistics of consumption in previous years, secondly, because such statistics as are available do not relate to actual consumption by consumers but to deliveries of sugar from manufacturers or refiners to the distributing trade. Moreover, no one can tell what the consumption would have been without rigid restrictions at a time when the demand for sugar was great in all directions owing to the general economic prosperity and the relatively low price of sugar as compared with other foods.

The imperative need, as stated above, was not the restriction of consumption to some particularly low point but the creation of some scheme of restriction which could be made to respond to the changing conditions of supply and tonnage. This the Food Administration accomplished without question since each state could only obtain as much sugar as was allotted to it and the problem of sugar distribution thus became a

matter of routine bookkeeping merely. Had the war continued another year it might have been advisable to embark on a policy of restriction of consumption, as a measure of economy of labor power, shipping tonnage, and fuel, and in that case, the Food Administration would have had the machinery for the purpose ready. Happily, however, the war ended and it was unnecessary.

IV. Conclusion

It will be noted that the signing of the armistice in November came but a few months after the various agreements with the producers, the creation of a new price basis, and the establishment of an effective control of distribution. Sufficient time had elapsed, however, to prove the practicability and soundness of the plan of dealing with all sugar problems through a government corporation.

An evaluation of the activities and policies of the Food Administration in dealing with sugar problems can hardly be attempted without going far afield into a criticism of the general policies of the Food Administration as applied to all commodities. Such a criticism is beyond the scope of this paper but it is necessary to note that considerations such as the relative food value of sugar in the nutritional intake of the nation, the inadvisability of incurring economic friction and popular discontent in an attempt to curb consumption through drastic compulsory measures, and the inadvisability of disturbing ordinary channels of trade and normal commercial practice in view of a possible sudden termination of the war were factors of great importance, consciously or unconsciously, in determining the policies of the Food Administration. It is only possible in this paper to note the important economic effects of government control of

sugar, first, the effect on production, second, the effect on prices.

The Cuban crop of 1917–18, which was the first crop produced under an agreement with the Food Administration was 3,446,083 [1] long tons or 422,363 tons greater than the preceding Cuban crop which was the largest crop up to that year, and the present year's crop produced under agreement with the United States Sugar Equalization Board is estimated at 4,000,000 long tons, or about 554,000 tons greater than even the previous record crop.

The beet sugar crop of the United States of 1917–18, the beets of which were planted in the spring of 1917 before Food Administration activities began, was 765,207 short tons,[2] representing a decline of 55,450 tons from the previous year's high record but 49,000 tons above the pre-war average. The beet sugar crop of 1918–19 which was produced under direct encouragement of the Food Administration as explained above was 765,063 tons, practically equivalent to the preceding crop. The Louisiana cane crop[3] was 243,600 short tons in 1917 as against 303,900 short tons in 1916 and a pre-war average of 229,000 tons, but in 1918 it rose to 263,450 short tons. The Porto Rican and Hawaiian crops show slight decreases for the last two years. The combined production in those sources of supply affected by government control increased 206,000 long tons in 1917–18 over 1916–17, and 1,301,000 tons over the pre-war average, and in 1918–19 increased 586,000 tons over the 1916–17 and 1,867,000 tons over the pre-war average. Whether or not the Food Administration was responsible for all of this increase, it is difficult to determine,

[1] Figures for Cuban production from Willett and Gray's Weekly Statistical Sugar Journal, June 12, 1919, p. 268.

[2] Crop Reporter, April, 1919.

[3] Ibid., January, 1919.

but it certainly cannot be seriously maintained in view of these statistics that the Food Administration policies tended to discourage production.

The facts as to prices are no less significant. In order to obtain this larger production, was the American consumer forced to pay an abnormally high price? The retail price of sugar increased from an average of 8 cents per pound in the year 1916 to 9.3 cents per pound in 1917 and 9.7 in 1918. Since the per capita consumption of sugar in the United States was about 79, 78 and 73 pounds in 1916, 1917, and 1918 respectively, including sugar used in all manufactured articles, the per capita cost of sugar amounted to $6.32 in 1916, $7.25 in 1917 and $7.08 in 1918, an increase of 14.7 per cent in 1917 over 1916 and 12 per cent in 1918 over 1916. The total sugar consumption of the United States for these three years amounted to about 3,658,607 tons, 3,683,599 tons and 3,495,606 tons [1] so that the sugar bill of the nation was about $665,622,000 in 1916, $767,367,000 in 1917 and $759,525,000 in 1918.

Yet altho the retail price of sugar increased only 21 per cent and the per capita cost only 12 per cent from 1916 to 1918, the beet farmers of the United States received an average price of $10.00 per ton for beets in 1918 as against $6.12 in 1916,[2] an increase of 63 per cent, while beet sugar manufacturers received an average of $8.12 per 100 pounds [3] in 1918 as compared with $6.98 in 1916, an increase of 16 per cent. Similar increases were obtained by the American refiners, the Louisiana sugar producers, the Cubans, Hawaiians, and Porto Ricans in accordance with their increasing respective costs.

[1] In long tons from Willett and Gray's Weekly Statistical Sugar Journal.

[2] Crop Reporter, April, 1919.

[3] Calculated from figures of Truman G. Palmer, "Concerning Sugar," p. 48.

The statistical evidence at hand indicates, therefore, that the American consumer did not pay for all the increase in costs of production of sugar, nor did he pay a premium for the increased production that resulted during government control. The general conclusion, to be drawn, both from the viewpoint of production and the viewpoint of prices, is that government control of sugar during the war was a decided success.

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REVIEW

WALSH'S THE CLIMAX OF CIVILIZATION: SOCIALISM; AND FEMINISM[1]

THESE three books may not improperly be called volumes I, II, and III, of the same work. In the preface to volume I the author says:

> Standing by itself, the present work is offered as a new exposition of the cyclical theory in the philosophy of history. It attempts to describe the course which all civilisations naturally run, and to locate our position in the cycle of our civilisation. This position is shown to be one near the top, or climax, and to contain premonitions of disintegration and decline. The purpose of the work is to point out these germs of decay, and to emphasize the need of guarding against fomenting and cherishing them. The two most comprehensive sources of trouble are the subjects of the two succeeding works.

The symptoms of our near approach to the climax, or of our having already passed it, the author observes from seven points of view, namely: (1) the military art; (2) economics; (3) population; (4) morality; (5) the fine arts, literature and jurisprudence; (6) religion, and (7) government. In each field of activity he observes, at least among peoples who have amounted to anything, a regular cycle from the strenuous, heroic, and masculine virtues of primitive life, up through conditions of power and prosperity, followed by the feminine virtues of softness, gentleness, sympathy and elegance, and then downward through enervation, ease, unwillingness to endure hardship, overconsumption, and decay.

In the field of economics, his cycle reminds one of E. V. Robinson's remark that when production exceeds consumption, there is progress; when consumption exceeds produc-

[1] The Climax of Civilisation, pp. 150, $1.25; Socialism, pp. 169, $1.50; Feminism, pp. 393, $2.50. By Correa Moylan Walsh. New York, Sturgis and Walton. 1917.

tion, there is retrogression;[1] tho he goes more into detail. In the field of morals he says, page 31 of volume I:

> Because of the need at first of contention, the virtues most dwelt upon, when intelligent observation was turned toward them, were the masculine virtues of fortitude, temperance, wisdom, and justice. But with the advent of the long peace and the coming into prominence of women, taking the place of those stern virtues another set of mild ones come to the fore — the feminine virtues of patience, purity, faith, and affection.

Again, on pages 32 and 33:

> By now the old intuitive morality has given way before a rationalising science of ethics, which, rejecting the old stand-bys as too rough, experiments with all sorts of new theories, and even with many which experience has long ago disproved. More attention is paid to the welfare of individuals than to the welfare of the whole society or race, and still less to its perpetuation, especially if each individual believes himself immortal. . . . Accompanying this change come new ideas about a general equality of the sexes; for women are equal to men in the point of view now emphasized — the capacity to enjoy and to consume. . . . With the breaking down of competition, there is less striving within each state as well as between states, until at last, with the diminution of production, especially if accompanied by exhaustion of the sources, a new period of hard times sets in, which generates strife again, but finds the more civilised peoples mostly unfit for it, and most likely to give way before the less civilised.

The author finds that feminism is only a part of socialism, tho he says that: "Feminism may be advocated without socialism — without the whole of which it is a part."

The significance of these volumes, however, is not to be found in the views they set forth, but in the wealth of learning and the discriminating judgment which they display. The author shows himself to be a real student, with a penetrating mind which can see through the ordinary claptrap of popular philosophy which has, unfortunately, sometimes been imported into the proceedings of learned societies.

The appearance of a cycle of growth and decay in national as in the individual life has long been a puzzle. There seems

[1] Cf. "War and Economics," Political Science Quarterly, vol. xv, p. 581.

to be no such physical necessity for the decay of a civilization as is found for the decay of a biological organism, but there are undoubted tendencies in the same direction. The very success of a race or a nation in building up a civilization seems to predispose it toward those habits which necessarily bring decay. The individual who has, by hard work and frugality, built up a fortune by producing more than he consumes will be difficult to convince that he should not stop working and begin to enjoy what he has accumulated. The difficulty will be increased with each generation of his heirs. Yet, nothing is more mathematically certain than the conclusion that if they do yield to this temptation, their consumption will soon exceed their production. If this tendency shows itself in the nation at large, it is equally certain that national wealth will thenceforward decline.

Again, even tho there are multitudes of people left in a state of poverty, the sight of so much wealth in the possession of other people will lead them to consider the cold-blooded question whether it would not be more profitable to try to rob them than to work for themselves. The sight of a conspicuously rich territorial group has never failed to arouse the cupidity of neighboring groups, provided the latter were strong enough to attempt inroads. Similarly, the sight of a conspicuously rich class does not fail to arouse an equal cupidity in the minds of other classes in the same territory whenever the latter feel strong enough to defy the laws of the land and make incursions over the class border. They who do not understand or appreciate this tendency in human nature will never have a very full understanding of the social problems of the present day. A careful reading of these three volumes should help the reader to such an understanding.

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NOTES AND MEMORANDA

ONE OF THE PHYSICAL FOUNDATIONS OF ECONOMICS

So many attempts have been made to resolve economics into a psychological science as to make it seem advisable to call attention, in some detail, to some of the physical factors which are likely to remain unaffected by psychological changes, even assuming that these psychological changes are, first, possible, and second, desirable. Some of these physical factors are so fundamental as to give character to the science of economics under all possible conditions. It seems probable that, so far as these physical factors can be ascertained, they would have to be reckoned with under any form of social organization, and with any institutional background. In certain respects, therefore, communism and capitalism, socialism and individualism, would look very much alike if they ever got into working condition, because they would have to meet certain permanent and unchangeable conditions.

It is obvious that the prime factors of production are but two in number, nature and man. There is no reason why we cannot extend this assertion to the other departments of economics, and in fact to all the other fields whose objects are the goal of human research. Production requires relations between the various parts of nature, between man and nature and between the various types of men. Whatever be the relations, there are only these two terms implied, man and nature. When economics uses these terms, it must assume their essential characters, their reactions, and their interactions, as discovered by the different departments of positive science. Economics assumes these discoveries, for it is not the

business of the economist to engage in physical and biological research, except in so far as the scientist has not concerned himself with the phenomena which are of interest to the economist. All this may appear to be a truism, and yet it has not infrequently been forgotten. As Böhm-Bawerk says at the beginning of his *Positive Theory*, even those economists who preface their works with statements of physical fact, soon forget their declarations; these statements are mere ornaments, having no connection with the rest of the work. Now and then there appears one who insists upon a firm foundation before further investigation.

There are certain facts concerning production which, as Mill remarks, are true whether we like them or not, because they are inherent in the nature of physical things. (1) The law of diminishing returns is based, as I shall try to show, upon chemistry and physics, and, like certain chemical and physical laws, is capable of being reduced to a phase of the law of probabilities. (2) The primary advantages of a division of labor are not due to any preference of ours, or to the institutions that we have seen fit to adopt. (3) The Ricardian law of rent is based upon physical variations in land as well as upon diminishing returns from land of a given grade. (4) The laws of population, while in part psychological, have still a substantial physical and physiological basis and (5) physiology, as well as psychology plays a large part in determining the laws of consumption. In a general and fundamental sense, there are certain ways of doing things that are more economical than others regardless of social or legal institutions, and of popular philosophies, fashions, etc.

The law of diminishing returns probably has more ramifications in the field of economics than any other single generalization, therefore I shall elaborate this law as a sample of the physical laws which underlie the science of economics. This law has been the object of attack especially of those whose interest in economics is secondary to their interest in social reform. It is therefore most important for us to distinguish carefully between the law itself and any conclusions that may have been drawn from it thus far, whether right or wrong.

From the older treatises on economics, the impression is given that diminishing returns is applicable only to the special case of agriculture. It is due particularly to Professor Carver that this law has become more general, and made applicable to any group of factors in production. He has insisted that this is no fleeting social phenomenon, but is a fact which has its roots in physics and chemistry. It is perhaps impossible to trace all the manifestations of this law to any one all-inclusive cause, but there is reasonable ground to suppose that it is traceable in great part to one fact which permeates all branches of science and even all activities of life. In the following attempt at a scientific explanation of this law, the procedure will be from the abstract to the concrete.

Let us take any fixed number of entities of a particular type which we may call x; then let us add to this successively increasing quantities of another type of entity which we may call y. Every time an addition is made let all the entities be paired off indiscriminately. Concerning the character of the resulting pairs as the number of y entities is increased, we can lay down this general proposition, that the number of mixed pairs, those composed of an x and a y, will increase as successive increments of y are added, but this increase in the number of mixed pairs will not be proportional to the increase in the number of y entities; the ratio of increase will be a diminishing one.

Let us next consider this case quantitatively. Suppose the number of x entities be 5, and the number of y entities added to this vary from 1 to infinity. If $1y$ is added to the $5x$, there will be 3 pairs of which 1 pair is certain to be mixed. In this case an addition of $1y$ gave us a product of one mixed pair, which is both the most and the least that can be expected. In mathematical language, the probability is here certainty, in practical language we have 100 per cent efficiency. If now we add $2y$ to $5x$, there will be a total of 3 pairs, of which we may have a maximum of 2 and a minimum of 0 mixed pair, but the probable number, or the average in the long run, will be something less than two mixed pairs but more than one. Thus by adding $1y$ we have not increased the number of mixed

pairs by 1, but by something less than 1; whereas i
case an addition of 1y gave a certain result of 1 m
Continuing in this way we find that if we increase th
of y up to infinity, the greatest probable number
pairs will be something less than 5. The following t
make this clearer:

No. of x	No. of y[1]	Maximum possible number of mixed pairs	Probable number of mixed pairs	Probabil of each x to f
5	1	1	1	100
5	3	3	2.14	71
5	5	5	2.78	56
5	7	5	3.18	46
5	9	5	3.46	38
5	11	5	3.67	33
5	21	5	4.20	20
5	95	5	4.80	
5	995	5	4.97	
5	999995	5	4.999998	

It will now be apparent to those who know mat
that the above is only an application of the theory
bility. Here pure probability alone was assumed.
concrete cases of pure probability can be found, for
in games of chance. Suppose we take 5x as meani
cards, and the various quantities of y as meaning
black cards. If increasing quantities of black ca
mixed with a fixed quantity of red cards, and if t
pack were then dealt out in pairs, the probable n
mixed pairs and the probability of each black card r
red card would work out in every case in the ma
described.

Let us take a still more concrete case. If in a cert
munity there were a thousand women all of marriage
and all desiring to be married, and if in this same co
there were only one man of marriageable age also d
be married, and if furthermore polygamy were prohil
probability that this one man would, within a m

[1] Only odd numbers of y may be taken, otherwise all will not be pai

period of time, be married, would amount, for practical purposes, to certainty. The same would be true of any small number of men. But if the number of men increased considerably and amounted, say to 500, we should not be at all certain that all of them would be married off within a given time. If the number of marriageable men reached 1000, the chances of marriage for each man, tho good, would be much less than before. If the number of men increased further to 2000, 3000, 4000, etc., each man's chances of marriage would gradually diminish, while the chances of each woman would increase.

Here some one will protest that human factors are being neglected. Men and women have qualities which are sometimes better and sometimes worse; in one instance there may be more likelihood of attachment than in another; in one community social life gives to each sex more opportunities to meet the other than in another. All this is true and even more. Despite this, however, the element of chance still remains, and we are justified in our conclusion that as the number of either sex increases, the number of the other remaining constant, the probability that any one of the first will be married diminishes.

Further study will convince us that the law of probability underlies most, if not all, natural phenomena, and where this is true when two or more factors are under consideration, the law of diminishing returns must hold true. Ever since the time of Laplace, who, at the end of the eighteenth century, was the first to make a systematic study of the theory of probability and its applications, more and more attention has been given to its applicability to science. Its real significance, however, was not apparent until the work of Professor Willard Gibbs of Yale University. In his *Statistical Mechanics* he showed that the second law of thermodynamics was only a deduction from the laws of probability, that in fact all physical and chemical laws which are concerned with molecular action are likewise deductions from the same laws. There are millions of molecules in any mass, moving about at a tremendous rate, going in all directions, and making in-

numerable collisions; yet at any state of pressure a perature, each molecule has an average mean velocit is on the whole an average direction and an average of collisions.

The laws of chemical equilibrium, including the law action, are corollaries of these laws of probability as to molecular activity. As this branch of chemistry technical, and as it would take us too far afield to detail, we cannot stop to derive these laws. Suffice that when two substances react, the extent and the ra reaction is governed by the active mass of each su As the reaction proceeds, the rate gradually diminish an equilibrium is reached. Because of these laws, an of either one of the substances in reaction will incr rate and extent of the reaction but not in proportio increase. For example, if we bring together ethyl and acetic acid, they interact to produce ethyl acet water. If we take these in equivalent ratio, action w when two-thirds of each is transformed into ethyl ace water. If the ethyl alcohol and acetic acid are bro gether in the ratio of three to one, the action will go nine-tenths of the acetic acid is converted.

Enough has been said to show that diminishing re not an isolated phenomenon. Let us take an exam agriculture to which the law was first applied. Th important elements of plant food in the soil are pot nitrogen, and phosphorus. For proper plant growt must exist in a certain ratio. If there is too little of element, the soil will not yield sufficient produce. If add some of this element to the soil in the form of a fe we shall have an increase of product. Up to a certa an increase in this element will bring an increase in t but again not in proportion to the increase of the e The following table, based upon the results of actual the Rothamstead station, will illustrate this point:

Plot						Average yield in bu. for 8 years	Gain for 43 lbs. of nitrogen
	5 mixed minerals alone					19	
6	"	"	and	43 lbs.	nitrogen	27½	8½
7	"	"	"	86 "	"	35½	7½
8	"	"	"	129 "	"	36½	1½
16	"	"	"	172 "	"	37½	½

There is here a diminishing return from successive applications of nitrogen.

In many cases it is more difficult to trace the cause of diminishing returns. Yet in every case we find chance as one of the factors. We saw before that in a community where there were few men and many women, every man would be fairly certain to meet a woman and enter into the relation of marriage. We can apply this to the three factors, land, labor, and capital. If the number of the units of any one of these is small, each unit will be more likely to meet units of the other factors. If, to take a concrete instance, there were only one plow in the community, this plow would combine with a large number of labor and land units, and it would be sure to meet some of these units all the time. If the number of plows became inordinately large, each plow could not be used as much as before, and plows would be idle a great part of the time. The important fact in each of these cases is the probability of idleness. A plow is capital, and an increase of plows is an increase of capital. The second plow would add a great deal to the product, and so also would the third and fourth, but not quite so much. The same applies to an increase of labor or land.

We can examine this fact more closely if we take an example from the manufacturing industry. Suppose a laborer is employed at a milling machine, milling the end of a steel rod. His task can be analyzed into a series of motions, which consist of those made to operate levers, to adjust the rod, take it out, and put another in its place. The laborer is capable of making a certain number of motions within a given time. If he operates only one milling machine, his motions can be adjusted almost perfectly to the milling process; that is to say, within a given time, the motions required to be made

will combine with the machine process to give a
result for each machine. If now, he operates tw
machines, the combinations of muscular motions
processes of the two machines will be more effectiv
point of view of total product, but less effective fo
chine. In other words, there is a diminishing retur
increase in the number of milling machines. Th
true, whether the constant be the number of men o
ber of motions each man is capable of performing.

In view of the preceding, it is hardly possible to
the law of diminishing returns is universally valid
cism is at all possible, it can refer only to the ap
which economists have made. Yet it is evident
applications can and must be made. As we are not
cerned with the subject matter of economics, but n
its fundamental notions, no attempt will be made
the law.

To those who might object that what has been
physical fact, and can have no foundation in positiv
I should point out again that all the laws of scien
said to rest on probability. The law of probability i
a part of the eternal nature of things as any of th
physics or chemistry. A protest might properly b
there were here any attempt to set up a permanen
probabilities with reference to any of the factors o
tion. The differences between the returns from one
of any factor and an increased quantity of the sa
may be reduced to a minimum, but physical fac
that some difference remain.

JULIUS L

A DEFINITION OF "CONDITIONS OF LABOR"

COLLECTIVE agreements between organizations of workmen and their employers generally provide that "wages, hours and working conditions" shall be determined by the joint decision of the representatives of both sides. What is meant by the terms wages and hours is of course clear, but the phrase "working conditions" (as well as its equivalents "conditions of employment" and "conditions of labor") is distinctly ambiguous. Many indeed regard this phrase as similar to the "necessary and proper" clause in the federal constitution, thus giving elastic powers to the joint body created to administer the agreement.

In the contests over interpretation, labor is almost invariably the broad constructionist party while management is the narrow. A study of collective bargaining in several industries cannot fail to impress one with the belief that the interpretation which is given to this term depends more upon the relative strength of the two parties than to the logic or rhetoric of the respective sides.

The very obscurity of the term, however, is leading many employers at least to be more cautious in agreeing to submit "working conditions" to the process of collective bargaining. They are typically beginning to inquire what the phrase includes, and some are insisting that its definition be written in the bond. Somewhat fearful of the increasing powers of organized labor, they are unwilling to trust to the process of evolution to define this term, since evolution may go against them. The formation of a joint agreement in one important industry has indeed been prevented at least temporarily by the uncertainty over this very phrase.

Plainly it is time that we should begin to define our terms and determine what this phrase means. The present definition is largely based upon the interpretation which the Shipbuilding Labor Adjustment Board gave to it. The following

subjects in the opinion of the author are included under working conditions:

1. *Sanitary conditions.* This is plainly a condition of labor and includes such topics as the provision of
   (*a*) First aid.
   (*b*) Proper toilet facilities.
   (*c*) Proper changing facilities.
   (*d*) Protection against industrial poisons or diseases. The Shipbuilding Labor Adjustment Board, for example, found it necessary to forbid the use of the "spray gun" in painting ships in order to protect the painters from lead poisoning.
2. *Safety conditions.* This also is clearly within the purview of conditions of labor. It includes:
   (*a*) The proper safeguarding of machines, equipment and conditions of work.
   (*b*) The education of the employees in safety measures.
3. *Apprenticeship and industrial education.* This has long been an accepted item for regulation of collective bargaining. Under it are included such topics as
   (*a*) The number of apprentices permitted.
   (*b*) The length of service required of apprentices.
   (*c*) The thoroughness of the training given.
   (*d*) The wages of apprentices and learners.
   (*e*) The relation of the industry to trade, industrial and continuation schools.
   (*f*) The plan and functions of the vestibule school.
4. *Questions relating to the paying of men.* The Shipbuilding Labor Adjustment Board found it necessary to legislate upon such questions as
   (*a*) How often should the workmen be paid?
   (*b*) Should payment be made upon employers' or employees' time?
   (*c*) How much of a man's pay can and should be held back?
   (*d*) How soon after leaving must payment be made?
   (*e*) Should workmen be compelled to make stipulated payments for medical and hospital care and in-

surance protection? If so, under what conditions? How should the fund be administered?

5. *The classification of workmen.* This is an important yet little considered topic. Who is to decide whether a man is a first or second class mechanic; a helper or an apprentice? The Adjustment Board was compelled to take this question into its own hands to insure justice to both sides.
6. Should men be discharged for legitimate trade union activity and what is the meaning of the term legitimate? A trade agreement recognizing a union or unions as one of the parties to it, generally protects men from discharge or discrimination because of union membership. But what about union activity? Can a man solicit membership
   (*a*) At work, as long as he does not interfere with his own job.
   (*b*) At the lunch hour.
   (*c*) Within the gates before and after work.
   (*d*) Immediately outside the gate.
   (*e*) What rights does he have as respects the holding of office in his union, etc.?
7. *Machinery for adjusting grievances.* How should grievances be adjusted?
   (*a*) By the intercession of the business agents of the unions? If so, what rights should they have inside the plant?
   (*b*) By committees of the employed? If so, should the representation be by trades or from the shop as a whole? What provision should be made for the representatives of minorities. The National War Labor Board in certain cases provided for some form of proportional representation in the election of these committees.
   (*c*) If shop or craft committees are authorized, what should be their relations to the unions and to the business agents.

8. *Definition of the term "grievances."* If machine vided to adjust grievances, what shall be regard proper grist for it to grind? Should it includ
   (*a*) Violations of the points mentioned under 1 to 6?
   (*b*) Such supplementary questions as alleged foremen, etc.?

The author feels quite clear in his own mind that ceding points all come under the definition of "con labor." He is not, however, clear about the followir but recognizes that they will probably be settled by tive strength of workmen and employers rather thai demic definition:

(1) Introduction of new processes. How far shoul under the joint control of labor and capital? should the workmen be protected against speec What consideration should be paid to the que productivity?
(2) Speeding up of old processes. This problem is t the introduction of new processes.
(3) What control should the workmen exercise o' foremen? No one in close contact with indust can ignore the fact that the workers are dem voice in the selection, placement and discharge foremen. Many walkouts have occurred recent because foremen they didn't like have been a or retained, or because foremen they did ap were discharged. Should workmen choose th foremen? Should they be chosen jointly? Sh management have the power of nomination workmen that of rejection? These questions into the problem of industrial democracy and c an answer. What should the answer of the ec be?
(4) What control over industry itself should the exercise? Might it not be argued that such q as the irregularity of employment, methods casualizing industry, and all forms of welfare wo

cannot be divorced from the conditions of employment and should be placed under the joint control of labor and the management?

The question of the closed or open shop, the writer believes should not come under the term "conditions of labor," but should receive separate treatment in the trade agreement.

The above approach toward a definition of the phrase "conditions of labor" is necessarily incomplete and inconclusive. The writer's hope is that it may serve to stimulate discussion and thus lead to a clearer and better definition.

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ANOTHER REASON WHY WAR PRICES ARE HIGH PRICES

AT the Richmond meeting of the American Economic Association Dr. A. C. Miller, after reviewing the conditions usually recognized as accounting for the great rise in prices during recent months, closed with the remark that the persistent rise in prices was a continuing mystery; that the usual formulae — increased gold supply, the expansion of credit, curtailed production, increased demand, and heavy exports — when given their due weight did not explain the phenomena; the rising price level was still a mystery.

It is not expected that the paragraphs which follow will resolve the mystery, but it is hoped that by calling attention to a factor hitherto little considered, if recognized at all, they may contribute something to the explanation of the fact that war prices are high prices.

One who accepts the quantity theory will of course look for the explanation of the changing price level in the distributed relation between the amount of currency in circulation, using the term in its broadest sense, and the amount of "money

work" to be done. The one point that this note deals with has to do with changes, not in the amount of currency, but rather in the amount of goods to be exchanged; and primarily with the one factor of the rapidity of their circulation.

An approach to the matter in hand may be made by a cursory examination of certain current explanations of the phenomenon. Increased cost of production is one of these. If, however, "cost" is used in the popular sense as synonymous with expense, the formula explains nothing, but merely accepts the fact for which an explanation is sought and states it in another way. If, on the other hand, "cost" is used in its technical sense, the formulae does not explain why prices should rise except as higher cost leads to a restriction of production; and if this is what is meant it seems better to state directly, if it is true, that prices have risen because of decreased production, due, let us say to increased cost of production. It does not appear, however, from the figures at hand that in the basic industries at least, there has been any diminution in production. In most such industries the last two years have been years of prodigious output; in many of them these have been banner years. The production of anthracite and bituminous coal, petroleum, copper, iron ore, and steel has been greatly stimulated. The great cereal crops taken together have yielded more during the last three years than during the preceding three-year period. Cotton production has not kept up to the high level of 1913 and 1914, but it has been well sustained at nearly twelve million bales. Potatoes and tobacco have shown great increases in 1917 and 1918 over previous years. The Chicago packers killed three million more meat animals in 1918 than in 1917, and according to figures given out by the Department of Agriculture meat production was greater in 1918 than in 1914 by 4.5 billion pounds. While the production of wool has shown no increase the imports were vastly greater during the last three years than for the preceding three. The imports of tea, coffee, and silk have shown substantial increases during the war and the imports of rubber more than doubled during the last three years as compared with the preceding three years.

In many lines of manufacture production has no doubt decreased, tho when the figures shall have become available it will probably appear that in the industries of large volume "high cost" has, on the whole, not checked production.

Another set of explanations approach the matter from the side of demand. The insistency of the government's demands is urged as a reason for rising prices — what the government wanted it would have at any price. For vast quantities of goods, marginal utility, the usual governor of consumption failed to exercise its steadying effect on purchases. Such feverish bidding as the government engaged in must, it is true, inevitably have forced a rise in the prices of the things bought, and in turn of those which entered into their production. If, however, for patriotic or other reasons there had been a corresponding check on private consumption, the insistent bidding of the government, while it would have caused a rise in the prices of the goods bought by the government, it would not, according to the quantitivist philosophy, have disturbed the price level. The only way the feverish bidding of the government could affect general prices was, to repeat, by disturbing the relation between goods and money means; and this it did simply by putting the government in possession of great quantities of goods. The effect would have been substantially the same if the government had commandeered the goods at established prices.

If the greatly increased demand of the last two years had been the result of more active private buying of the usual sort and the goods had circulated through the usual channels general prices would have risen. But there is this peculiarity about government purchases that enhances their power to affect the price level: When once they are made the goods are withdrawn from circulation at once and finally. Under peace conditions a large proportion of the steel production would have passed through many hands in one form or another before reaching the final consumer, making a demand for money or money means at every exchange and the same is true of the products of the textile mills; but government orders went directly from the mill to the final consumer.

Vast quantities of goods passing directly into the hands of the government ceased to circulate as effectually as tho they had ceased to exist. In the Quartermaster General's *Report for 1918* there is an interesting chart showing the distribution of stocks from factory to reserve depots, from these depots to training camps, embarkation ports, intermediate depots, and so on to the "regulation stations" and finally to the soldier, but at no stage did they constitute a demand for money; stores were "requisitioned" and "issued," not bought and sold.

The scale of these withdrawals of goods from circulation is indicated by the following table showing the amounts of various supplies ordered by the War Department from April 1, 1917 to the signing of the armistice, the amounts delivered to February 8, 1919, and the amount of the orders cancelled.

	Ordered	Delivered	Cancelled
Stockings, light woolen, pairs	70,111,000	52,652,000	1,427,000
Stockings, heavy woolen, pairs	63,375,000	47,788,000	589,000
Undershirts, cotton	50,170,000	44,956,000	901,000
Undershirts, winter	35,852,000	31,636,000	100,000
Undershirts, winter	35,852,000	31,636,000	100,000
Coats, various materials	54,700,000	47,523,000	4,469,000
Trousers and breeches	50,799,000	45,131,000	3,466,000
Gloves and mittens, pairs	45,222,000	41,228,000	1,101,000
Boots and shoes, pairs	33,287,000	31,901,000	

The War Department's purchases of subsistence to the signing of the armistice amounted to $729,000,000. The Navy, the Shipping Board and other agencies of the government were similarly active buyers in their fields. Keeping in mind the uncertainty of the duration of the war and remembering over what distances goods had to be moved and the number of points at which depots of supplies had to be maintained, there seems to be some excuse for the "wild orgy of buying" [1] indicated by these figures.

Now, if these commodities and others of which they are typical would ordinarily pass through the hands, say, of three

[1] The New York Times, February 23, 1919.

sets of dealers from factory to consumer, the government purchase of them reduced their circulation by two-thirds. But, in addition to this, the government's method of buying in many cases brought it in control of goods before fabrication; in control of the cloth and even of the fiber of which it was made. The Paymaster General of the Navy in his last report mentions purchases of 14,500,000 yards of denim and cloth. The War Department's order for textiles of various kinds amounted to 598,250,000 yards, while cancellations of these orders amounted to only a little more than 10,000,000 yards. The government's purchases of wool down to February 15, 1919 reached 612,450,000 pounds and it was obligated to buy 110,000,000 pounds more.

The effect of this large-scale purchase by the government, often in the early stages of production, and its method of dispensing them without the further use of money, by decreasing the rapidity of circulation of great quantities of goods, must have affected the price level in the same way as would a reduction in the amount of goods, or a sudden resort to barter on a large scale, or to a more direct move of marketing. This peculiarity of the government's demand is not, of course, the most important factor of the many operating to produce the high price level. Inflation, on the one hand, as Dr. Miller frankly calls it, and increased consumption at home and the swelling exports on the other, are doubtless the dominant forces; but surely the falling off in the "demand for money" through the withdrawal of large quantities of goods from the ordinary channels of trade is a factor that cannot be neglected when the attempt is made to explain the mystery of the present price level and to show why war prices are always high prices.[1]

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[1] It is possible also that study may show that the government's regulations of prices and of profits, while designed to prevent the rise of particular prices, may by the process of limiting the number of transactions have caused a diminution in the demand for money that had an appreciable effect on the general rise in prices.

AN OVERSIGHT IN THE THEORY OF INCIDENCE

In studying, recently, with a class in taxation, Professor Edwin R. A. Seligman's *The Shifting and Incidence of Taxation*, the writer of this note came across the discussion of *A Uniform Tax* (on agricultural land) *according to the Quantity or the Quality of the Land*.[1] Analysis of the argument of a part of this section seems to show a rather important oversight which entirely vitiates the conclusion.

Professor Seligman's discussion of the matter here in question is as follows:

" Suppose that there are three tracts of land producing wheat of the same quality, but, as a result of differences in fertility, yielding respectively ten, twenty, and thirty bushels to the acre; and suppose further that this quality of wheat is worth 50 cents a bushel. Tract A would thus yield $5.00 an acre, tract B, $10.00 and tract C, $15.00."

Then " if in the above case the tax per acre on grade A were 50 cents, on grade B, $1.00 and on grade C, $1.50," the price of wheat would be " 55 cents per bushel " instead of 50 and " the amount of taxes paid by the landowners would exactly equal the increased price obtained from the consumers. Hence, whenever a land tax is graded as to follow with precision the differential advantages of production, and where the land is cultivated intensively *up to the point when the law of diminishing returns becomes effective*,[2] given a constant demand, *the tax will be shifted entirely to the consumers*,[3] without causing them any additional loss."

It is not clear what Professor Seligman means regarding diminishing returns. In the strict sense of the expression, returns would begin to " diminish " on tracts C and B long before it was worth while to cultivate land as poor as tract A.

[1] See third edition, New York (The Columbia University Press), 1910, pp. 259, 260.

[2] Italics are the present writer's. [3] Ibid.

What should be assumed is that the better tracts are cultivated intensively up to such a point that the marginal return to labor (or labor and capital) on them is no greater than the return to labor on the extensive margin. For the remainder of the present discussion it will be presumed that this is what Professor Seligman really means. It is evidently assumed — altho it is not specifically stated — that the differences in fertility among the different tracts are natural and more or less permanent rather than that they are maintained by differences in effort and investment among the owners.

The principal point which is involved in the main criticism here advanced is the nature and significance of the intensive margin of cultivation. On Mr. Seligman's assumption regarding different grades of land, tract C yields 30 bushels to the same amount of labor which can get only 10 from tract A. But it may be entirely possible that the labor which yields 10 bushels on A could, by being used for the more intensive cultivation of C (or B), add 9.8 bushels to the product otherwise there yielded, making a total of 39.8 bushels. To assume an addition to the product on this tract, from the added labor, of anything over 10 bushels, would be inconsistent with the hypothesis that tract A is actually used. But to assume an addition of 9.8 bushels is entirely consistent with that hypothesis.

Let us turn now to the tax of fifty cents on tract A, $1.00 on tract B and $1.50 on tract C. Since tracts B and C are superior to tract A by more than the entire tax to which their owners are to be subjected, these tracts would continue to be used to produce wheat and to produce at least as much as if untaxed, even if there were no increase of price whatever because of the tax. It is because the owner of tract A will cease cultivating if he cannot get fifty cents more for his 10 bushels, when the tax is laid, that the tax is supposed to be shifted entirely upon the consumers in a price of wheat five cents higher per bushel than before. But if the labor which produces 10 bushels on A can, by increased intensiveness of cultivation, add 9.8 bushels to the product of C, this result clearly need not follow. For the tax, being graded upon the

land according to quality, will not be raised on tract C because C is now worked more intensively. That is the extra 9.8 bushels produced on tract C adds nothing tax. Hence, the producer of this 9.8 bushels need ceive $5.00 to induce the production [1] and not $5.! $5.00 for 9.8 bushels is little more than fifty-one bushel. It follows, then, that the tax need not raise t as claimed by Seligman, by five cents a bushel, the which would reimburse the owners of all the farm lan A, B, and C) for the tax, and which would be nec keep tract A in use, but only about one cent a bu amount necessary to cover the extra cost of producir on the (now) slightly lowered *intensive* margin.

The same oversight above criticized occurs near th ning of the section here under discussion, where I Seligman supposes a tax of fifty cents on each acre cultural land without regard to quality and conclu such a tax would raise the price (demand being cons five cents a bushel. No such conclusion necessarily

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[1] Admission is made that such a tax, by reducing slightly the efficiency of duction might, according to the quantity theory of money, slightly raise level of prices and the price of wheat with the rest. No allowance is made for however, in the discussion above.

A NOBEL PRIZE IN ECONOMICS

The Norwegian Nobel Institute, at Christiania, begs us to bring to the knowledge of the students of History and Economics, that it has resolved to set up for international prize competition the following subjects:

> "*An Account of the History of the Free Trade Movement in the Nineteenth Century and its Bearings on the International Peace Movement.*"

The essays can be written in English, French or German, or in one of the Scandinavian languages.

The author of the eventual prize essay will be remunerated with kr. 5000 — five thousand Norwegian crowns. His work will then become the property of the Norwegian Nobel Institute.

The essays bearing an epigraph and accompanied with a sealed envelope containing the name of the author, must be sent in to the Norwegian Nobel Institute, 19 Drammenavei, Christiania, before July 1, 1922.

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RAILWAY SERVICE AND REGULATION

BY

C. O. RUGGLES

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RAILWAY SERVICE AND REGULATION

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THE world war with its abnormal demands upon the railways of this country has strikingly emphasized the inadequacy of our transportation system. The extra burden thus thrown upon the railroads has been due, among other things, to a larger amount of traffic, a falling off of water-borne tonnage, and unusual labor conditions. In the first five months after a state of war was declared to exist between this country and Germany, the railroads handled more freight tonnage than in any whole year previous to 1904.[1] On 51 per cent of the railroad mileage of the United States in the summer of

[1] Railroads' War Board, Official Information No. 18, November 27, 1917.

1917, there was an increase of 16 per cent, or 3,354,000,000 ton miles in one month. This was equivalent to adding 35,000 miles of railroad to that of the United States, with an average density of freight traffic on each mile equal to the average density of all railroads in the United States in 1915. This virtual addition to the fixed plant of American Railroads nearly equaled the total railway mileage of Germany in 1913 and exceeded that of Great Britain in 1914.[1] In the last annual report of the Pennsylvania Railroad Company,[2] it is claimed that the ton mileage of that system for the year 1917 exceeded by over 60 per cent the combined annual ton mileage before the war of all of the railroads in Great Britain and France.

That less water-borne traffic has been responsible for a part of this marked increase in rail traffic may be seen from the fact that vessels, not only from the Great Lakes but from our intercoastal trade, have turned to the more profitable ocean carrying trade. This shift is reflected in the percentage of our exports and imports which have been carried in American vessels since the war began. In the fiscal year 1914, this percentage was 9.7; in 1917, it was 18.6.[3] In the fiscal year 1915, there was a total of 335 vessels with 1,846,658 tons cargo in the coastwise trade from the Atlantic to the Pacific and *vice versa*. In the first half of the fiscal year 1917, there were but eighteen vessels with a tonnage of 97,363.[4] From testimony before the Newlands Committee, it appears that prior to the autumn of 1915 there never had been

[1] Railroads' War Board, Official Information No. 8, July 7, 1917.

[2] Seventy-first Annual Report (1917), p. 7.

[3] The figures from 1914 to 1917 (fiscal years) are as follows: 1914, 9.7; 1915, 14.3; 1916, 16.3; 1917, 18.6. Annual Report, Commissioner of Navigation, 1917, p. 101.

[4] Panama Canal Record, vol. x, p. 464. See also statement of Julius Kruttschnitt in hearings before the Committee on Interstate Commerce, U. S. Senate, 65th Congress, 2nd Session, pursuant to S. Res. 171, pp. 196, 197; hereafter referred to as Hearings on Government Control.

a record of a carload of grain moving from Oregon or Washington over the Union Pacific to the Atlantic Seaboard; that since that time, many thousand of carloads had been sent overland on that and other railways to Atlantic ports.[1]

Conditions in the labor market as a result of the war have made it difficult for railroads to maintain their former standards of efficiency. Losses of employees have been due to withdrawals to enter military service, as well as to enter industrial fields offering distinct advances in wages or salary. Consequently, the loss has not been confined to any one class. In December, 1917, the Railroads' War Board stated that the railroads generally were short-handed; that at that time some carriers reported a net shortage of 12½ per cent in the number of laborers, and a much larger percentage of loss in efficiency because of the necessity of filling vacancies with unskilled and inexperienced men.[2] In some engine houses the railroads were reported to be employing men who did not know the difference between a monkey wrench and a fire hook.[3] The effect of the loss in the lower tier of labor has been the more serious in view of the conditions which have affected immigration. Furthermore, unskilled laborers once secured by the railroads are constantly shifting to positions with industrial concerns, once they have learned of such possibilities. This has been true of large numbers of negroes that have been brought into northern states.[4] The last annual report of the Pennsylvania Railroad shows that that company hired 278,000 persons from all parts of

[1] Testimony of Judge Lovett in Hearings before the Joint Committee on Interstate and Foreign Commerce, 65th Congress, 2nd Session, pp. 772–775; hereafter referred to as Newland's Hearings. See also statement by Commissioner Hall in Hearings on Government Control, pp. 46–47

[2] Railroads' War Board, Official Information No. 19, December 5, 1917.

[3] Railway Age, December 14, 1917, p. 1082.

[4] Traffic World, November 18, 1916, p. 1008.

the country and distributed them over its system.[1] This is at least four times as many men as were usually hired in order to keep up its force.[2] All this has meant less efficient transportation service and a deterioration in the railway plant. Locomotives have been used longer before sending them in for repairs because of the heavy traffic to be moved; once in the shop, they have received less efficient repairing, and have limped out only to return and repeat the process. Little wonder there should have been such a locomotive shortage during the severe winter of 1917–18.[3]

These features of the transportation situation have been of sufficient importance to account for the inability of the carriers to meet the demands made upon them in the last two years. There is danger, therefore, that the war will receive much more consideration than it deserves as a direct cause of the inadequacy of our transportation facilities. The items above mentioned have received much attention in the press, while other less conspicuous but more fundamental factors, because more permanent, have not received the serious con-

[1] Annual Report, 1917, p. 5. President Rea observed, "The employment and training of these men was costly and seriously hampered operations, because many of them remained only a short time in the service." Ibid., loc. cit.

[2] The Railway Age, March 8, 1918, p. 490, states the number of new men hired by the Pennsylvania Railroad in 1917 as 177,000, and says "This is at least four times the number of men that had been taken on new in any previous year."

"The railways of the United States engaged in Interstate Commerce employ about 1,800,000 persons. If we include interurban and street railways, the number is increased to over two million. Now conceive, if you will, a great map of the United States on which each of these employees is represented by a tiny electric light. Some are moving along the familiar tangled lines indicating railway systems, but the greater number are stationary and grouped about the large terminals. Everywhere lights are being extinguished, sometimes by death, more often by the resignation or discharge of an employee; and everywhere new lights are appearing as new employees are hired. Five times a minute, 300 times an hour, 7200 times a day, employees are being lost and replaced. These figures are assumptions only, but they are conservative and probably far below the facts." From an article, "Mobilising Intelligence on American Railroads," by Norman Collyer of the Southern Pacific Railway, in Railway Age, February 22, 1918, pp. 419–421.

[3] See ibid., April 5, 1918, pp. 907, 908. Both the lack of men to do repair work and the character of the repair work done are reflected in the 1917 report of the Inspector of Locomotives to the Interstate Commerce Commission.

sideration to which they are entitled. Furthermore, in our regulation of railways in normal times, the charge which should be made for service has been emphasized. The character of the service itself has received too little attention.[1] It is therefore pertinent to inquire to what extent the transportation facilities of this country were inadequate even before the world war; to try to discover the causes for this condition of affairs; to examine the consequences of such inadequacy; and, finally, to suggest wherein our regulation and control of railways in future should give more attention to the sufficiency and efficiency of the service. Such a study of our transportation system is of value whether, as a result of the war, we have government ownership, or whether the roads be returned to their owners.

The extent to which the American transportation system has failed at times in the past to meet the demands made upon it, is very difficult to measure. Statistics of so-called car shortage register in a general way the inability of the railroads to move traffic which is offered to them; but, as will appear later, the popular view is narrow in assuming that the inability of carriers to meet the demands made upon them is necessarily due to a shortage of equipment. In January, 1907, the American Railway Association began the publication of statistics of car shortage.[2] Table I (Appendix, p. 175,

[1] See statement of Commissioner McChord, before National Association Railway Commissioners. Proceedings, 1908, p. 15.

[2] Fifty of the largest companies were chosen and asked to give facts concerning car shortages and car surpluses. The first report was made on January 2, 1907; the second on February 6, 1908. By that time the committee was so discouraged by the large car shortage that they did not make up another report until April, 1908. Then the American Railway Association met and instructed the committee to secure statistics every two weeks. These instructions were carried out after that with the exception of the period from October 15 to February 1, 1915, when the car surplusage was so great and railroad depression so marked that the American Railway Association temporarily discontinued the compilation as a matter of economy. After February 1, 1915, the statistics were compiled once each month by the Association. The U. S. Railroad Admin-

infra) gives these statistics from January 2, through 1917.[1] This table indicates the ability railroads to furnish equipment in various yea during certain seasons of the year. It will be ob from the column marked "Net Shortage" th ditions were acute in January and February o that the net shortage disappeared in July, 19 appeared again in September of that year and co until the latter part of November. No net s appeared again until November of 1909, and th to a minor extent. Not until the fall and winter was there another net shortage, which was only less severe than that of the corresponding pe 1907, but it continued somewhat longer than i With the exception of a slight scarcity for a month in the fall of 1913, no further net short peared until the first of March, 1916. This co for that month only; but was followed by a shortage beginning in September, which has co since with varying degrees of intensity.

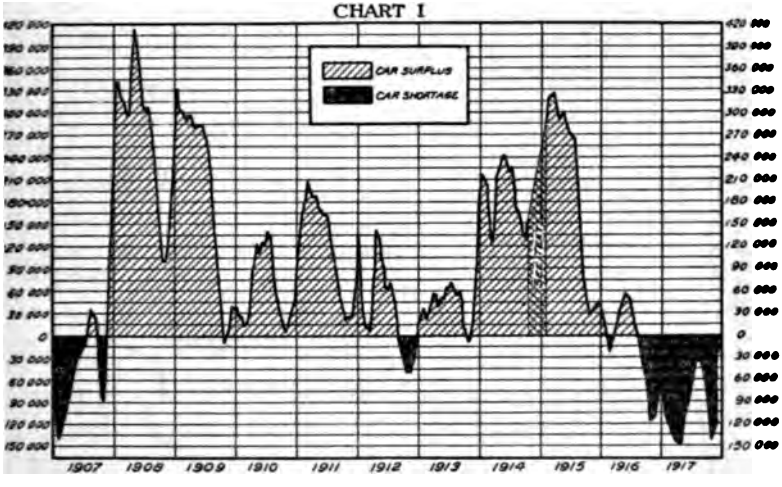
Examination of Table I and Chart I (based on Table I) shows that it is unusual for any car sho occur in the spring months and that it is heaviest the autumn. The figures show that in April, 190 was a surplus of equipment of 413,338 cars; th November, 1913, to March, 1916, there was a con surplus of equipment, the number reaching 200,0 in the month of October, 1914, when the America way Association as an economy measure disco its statistics. When the Association resumed

istration has not continued these statistics. See Proceedings National Railway Commissioners, 1908, p. 43. The figures in Table I have been American Railway Association Bulletin No. 6, February 6, 1917, and fr later bulletins. Many valuable statistics also in Proceedings American Rai ciation, vol. vii, pp. 522–575. See also House Report No. 1553, 64th Co Session, to accompany H. R. 20352, pp. 1–12.

[1] Statistics as given in Table I have not been continued since the rail taken over by the government.

lection of statistics on February 1, 1915, the surplus amounted to over 279,000. The shortage after the spring of 1916, as is well known, was coincident with a heavy war traffic.

Statistics of car location indicate that certain sections of the United States suffer much more than others on account of car shortage.[1] For example, box cars considerably in excess of ownership were on the lines serving what are known as New England, Southeastern,



Trunk Line and Central Freight Association territories, represented on Map I [2] as groups 1, 2, 3, and 4. All the other groups were deficient in this class of equipment in comparison with their ownership. Southern, Southeastern and Trunk Line territory, represented by groups 2, 4, and 5 on Map II, are the sections that had less

[1] Car location statements are given in Proceedings of American Railway Association, vol. vii, pp. 524–575. More recent statistics were presented by F. B. Dow, attorney for Interstate Commerce Commission in Hearings on Senate Bill (636), May 3, 1917. Statistics formerly published by American Railway Association are now published bi-monthly by the U. S. Railroad Administration.

[2] Maps from testimony of Dow, ibid., loc. cit.

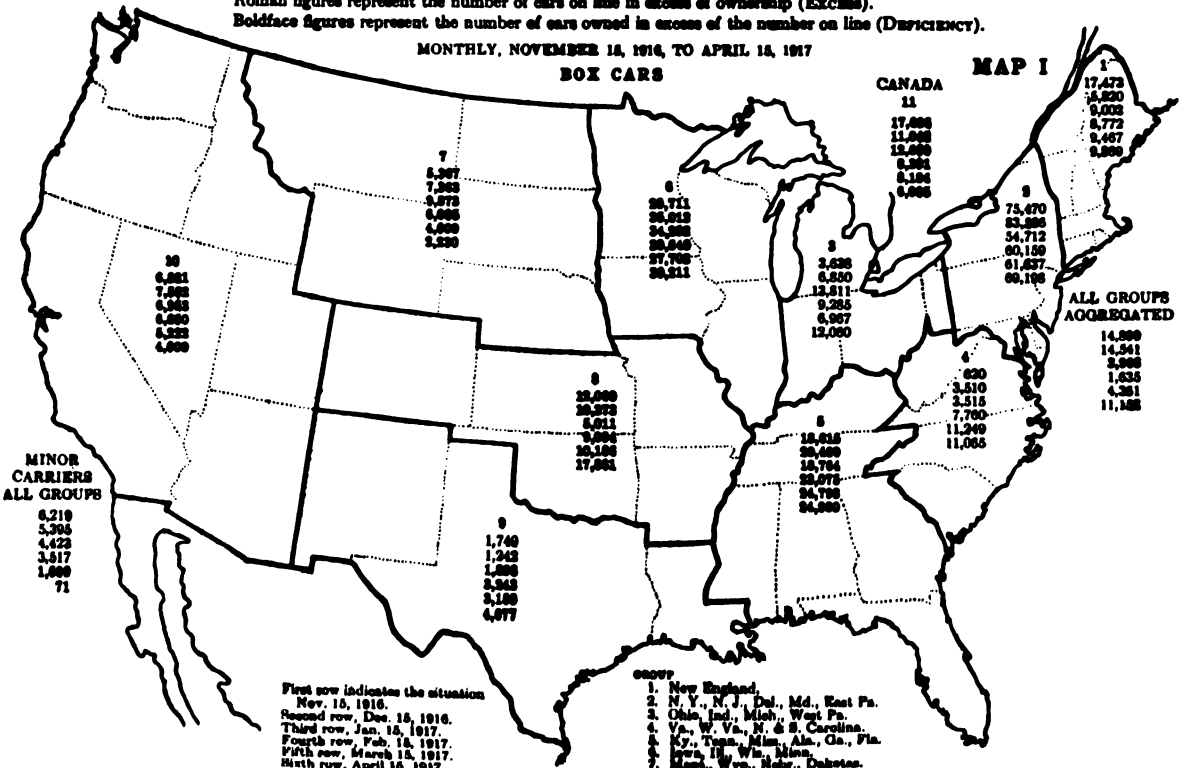
CAR LOCATIONS

Roman figures represent the number of cars on line in excess of ownership (EXCESS).
Boldface figures represent the number of cars owned in excess of the number on line (DEFICIENCY).

MONTHLY, NOVEMBER 15, 1916, TO APRIL 15, 1917

BOX CARS

MAP I

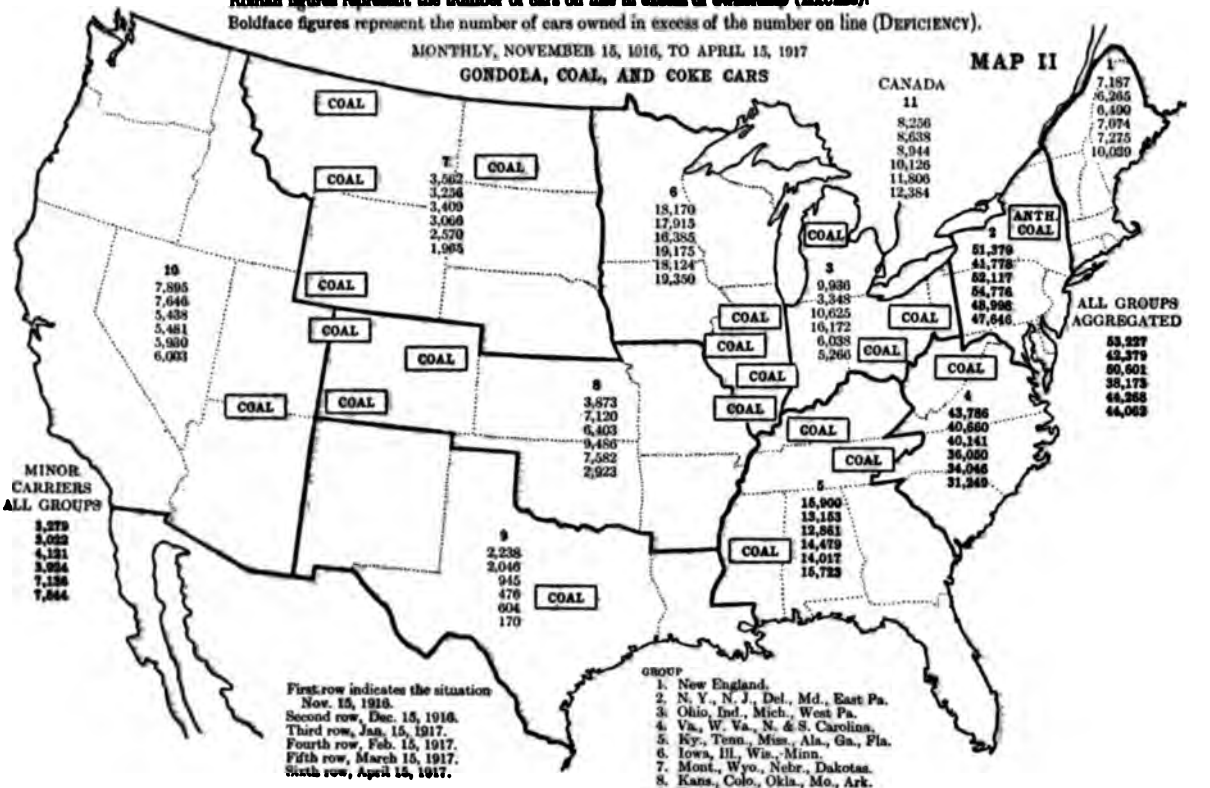


Roman figures represent the number of cars on line in excess of ownership (EXCESS).
Boldface figures represent the number of cars owned in excess of the number on line (DEFICIENCY).

MONTHLY, NOVEMBER 15, 1916, TO APRIL 15, 1917

GONDOLA, COAL, AND COKE CARS

MAP II



First row indicates the situation Nov. 15, 1916.
Second row, Dec. 15, 1916.
Third row, Jan. 15, 1917.
Fourth row, Feb. 15, 1917.
Fifth row, March 15, 1917.
Sixth row, April 15, 1917.

GROUP
1. New England.
2. N. Y., N. J., Del., Md., East Pa.
3. Ohio, Ind., Mich., West Pa.
4. Va., W. Va., N. & S. Carolina.
5. Ky., Tenn., Miss., Ala., Ga., Fla.
6. Iowa, Ill., Wis., Minn.
7. Mont., Wyo., Nebr., Dakotas.
8. Kans., Colo., Okla., Mo., Ark.
9. Tex., La., N. Mex.
10. Oreg., Wash., Idaho, Nev., Cal., Utah, Ariz.
11. Canada.

gondola, coal and coke cars on their lines than they owned. In 1916 the state of Nebraska memorialized Congress to enact legislation which, among other things, would insure the return of equipment to the roads in that section.[1] Conditions were so bad in Illinois about the same time that the Chairman of the Public Utilities Commission of that state made a trip to the seaboard to try to find out why railroad equipment of western lines was being detained in the East. He maintained that grain elevators in Illinois were full and that some elevators had received but one empty car a week, in some cases but one car per month.[2] On a tour in March, 1918, through seven states of the far West and Northwest for the United States Department of Agriculture, to stimulate a greater acreage of spring wheat, President Thompson of Ohio State University found that many of the alleged violations of the rules of the Food Administration in that area were due to the shortage of cars and transportation service. Areas that had much wheat could secure no substitutes; many small places were reported to have received but one car per month; potatoes were rotting in Idaho because they could not be marketed; live stock in some areas were almost starving, while but twelve hours away by rail, hay was rotting that could be transported.

In view of such unequal distribution of equipment among railway systems, it is not surprising to learn that the Interstate Commerce Commission discovered in its investigations in 1906 that in furnishing cars, railroads stipulated that their equipment should not go beyond their own line.[3] If the shipper did not care to consent

[1] For copy of memorial, see Hearings before House Committee on Interstate and Foreign Commerce, 64th Congress, 2nd Session, on H.R. 19546 and H.R. 20256 and H.R. 20352, hereafter referred to as "Esch Hearings."

[2] Esch Hearings, p. 41.

[3] Kansas City Hearings, pp. 192, 196; Minneapolis Hearings, p. 137; St. Louis Hearings, pp. 3, 4, 7, 8, 36, 117, 118. See note 3, p. 139. See also Railway Age, April 26, 1907, p. 683.

to this arrangement, he received no cars. That the roads have continued to resort to this method of keeping their equipment at home is seen from the evidence which was given to Commissioner McChord at Louisville, Kentucky, in November, 1916.[1]

The consequences of the inadequacy of the transportation system have been so insistently forced upon our attention since the outbreak of the war that comment concerning recent conditions is unnecessary. But it is not generally appreciated that transportation has been carried on under intermittent embargoes upon freight for more than a decade. Conditions were so bad more than ten years ago that the Interstate Commerce Commission made investigations, taking testimony relative to conditions at widely separated points.[2] Substantially, all told the same story of failure of transportation facilities and resulting commercial embarrassment and loss.[3] The investigations of the Interstate Commerce Commission at that time showed clearly that the business offered to the carriers was far beyond the transportation facilities. The Commission was informed that farmers, especially in the Northwest, were unable to market their grain because of the inability of the carriers to serve them; and that grain was being stored on the ground in some instances in bins eighteen to thirty feet deep, and covering acres of ground.[4] The testimony taken by the Commission showed that the country elevators were

[1] 42 I. C. C. R. 657 (662).

[2] Testimony was taken relative to conditions in such widely separated areas as the lumber producing regions of Oregon and Washington, the Southern cotton belt, the West Virginia coal fields, and the grain fields of Iowa, Kansas, Nebraska, and the Northwest.

[3] Testimony in Senate Documents, 59th Congress, 2nd Session, Nos. 233 (pp. 1–275) and 333 (pp. 1–502). Document No. 233 contains the testimony taken at St. Louis and Kansas City. The testimony taken at both places is paged consecutively in this document, hereafter referred to as "St. Louis Hearings" and "Kansas City Hearings." Likewise Document No. 333 contains the testimony taken at Minneapolis and Chicago, hereafter referred to as "Minneapolis Hearings" and "Chicago Hearings."

[4] Railway Age, December 7, 1906, p. 722.

full because grain could not be shipped to important terminal elevators. Up to the time the Interstate Commerce Commission made the investigation, in the latter part of December, 1906, important terminal elevators had not been more than one-third full.[1] Naturally this meant much loss to the farmers, not only from grain spoiling or its destruction by vermin,[2] but also because grain buyers insisted upon much wider margins in all purchases, and hence offered a lower price to the farmer.[3] In some instances grain dealers refused to buy grain at any price, because of the uncertainty of getting it to market or the likelihood of damage through heating due to the unusual length of time it would be in transit.[4] Selling grain in terminal markets on contracts was extremely difficult if not impossible. Purchase at a loss was sometimes necessary to cover such contracts.[5] This uncertain movement of wheat and lack of transportation meant that flour mills were often forced to shut down, in some instances for two months at a time.[6] All this meant that farmers were forced to borrow money and pay interest on it and, in some instances, to pay storage and insurance on grain, which later they were compelled to sell at a reduced price. The president of a national bank in the Northwest presented to the Commission letters from 350 banks in his state that had accounts with his bank showing that farmers were obliged to hold their wheat because of lack of cars; and he indicated that altho ordinarily he would not be lending a dollar to

[1] 12 I. C. C. R. 561 (563).

[2] Chicago Hearings, pp. 396, 419, 420, 474, 475; St. Louis Hearings, p. 71, and Minneapolis Hearings, p. 117.

[3] Minneapolis Hearings, pp. 31, 97, 98–99, 113–114, 130, 133, 198; Kansas City Hearings, pp. 270–271.

[4] Kansas City Hearings, p. 212; St. Louis Hearings, p. 50; Minneapolis Hearings, p. 14.

[5] Minneapolis Hearings, p. 102.

[6] Kansas City Hearings, pp. 232, 270–271, 272; St. Louis Hearings, p. 48; Minneapolis Hearings, p. 133.

these banks at that time of year, he had within a sixty-day period extended credit to these correspondents to the extent of $600,000.[1]

There was much trouble also in the marketing of live stock throughout the important live stock areas.[2] Dealers waited for cars weeks and even months. In instances where it was necessary to drive live stock some distance to the station, it had to be kept in yards or small pastures while waiting for cars. This often meant shrinkage in the weight of fat cattle to the extent of 200 pounds per head. It was sometimes necessary to wait so long for cars that it was too great a sacrifice to market cattle, and they were driven back to pasture. Those who were forced to sell their live stock, after waiting for weeks for cars at one station, were compelled to drive them across the prairie from seventy-five to two hundred miles to another railroad, there again to find conditions but little better.[3] The president of the American Live Stock Association testified that in Texas the delays in shipping cattle extended from two months to "any indefinite length of time."[4] The secretary of the same Association testified that in Wyoming it had been necessary to hold sheep at the loading station from thirty to sixty days; and then in some instances it was necessary to trail them for two hundred miles across the country to another railroad.[5] It was sometimes necessary to dip sheep as many as three times while waiting for cars.[6]

[1] Minneapolis Hearings, pp. 119–120; 12 I. C. C. R. 564; for similar testimony by other bankers and elevator men, see Minneapolis Hearings, pp. 117, 132, 170.

[2] It was contended in the Kansas City Hearings (p. 148) that stock men of Panhandle, Texas, alone lost hundreds of thousands of dollars because of inability of railroads to furnish transportation.

[3] Testimony relative to the trouble live stock shippers had in securing railway service, in Kansas City Hearings, pp. 147, 148, 151, 153, 154, 155–158, 162, 163, 166, 173, 174, 175, 183, 190; St. Louis Hearings, pp. 69–70, 115–116; also Senate Doc. 311, 60th Congress, 1st Session (1908), Hearing on S. 3644, pp. 1–134.

[4] St. Louis Hearings, p. 145.

[5] Kansas City Hearings, p. 177.

[6] Ibid., p. 162.

Furthermore, when cars were furnished for live stock, trains moved so slowly that it meant much shrinkage before markets could be reached.[1] Railroads even provided contracts which it was said "shippers had to sign"[2] which gave the railroad the right to ask a shipper to unload at the terminal of their road in order to keep their equipment from going off their own line.[3] Hence shippers were often seriously limited in the markets they were able to reach without great inconvenience and loss.

In the South there was much trouble in the shipment of cotton. Railroad platforms were piled full, and it was stacked upon the ground.[4] Lumber mills found it impossible to run much of the time.[5] The President of the St. Louis Lumber Exchange testified before the Interstate Commerce Commission that it was impossible to sell lumber on contract.[6] This meant that building operations in many states were interfered with. Some building concerns of much stability were on the verge of bankruptcy.[7] All lines of business were of course much affected by the transportation furnished the coal mines; many mines were closed or operated but part time.[8] In 1906, in some places in the Northwest, schools and public utilities were without coal.[9] In some in-

[1] St. Louis Hearings, pp. 116, 147; Kansas City Hearings, pp. 162, 189.

[2] See Senate Doc. 311, 60th Congress, 1st Session (1908), pp. 81, 88.

[3] Copy of such a contract (the Atchison, Topeka & Santa Fe Railway Co.) given in ibid., pp. 81–87. Some railroads went to much expense in unloading dead carload freight in order to keep their own cars on their own lines. Kansas City Hearings, p. 226. Naturally all this unloading for shipment to destination in other cars meant terminal congestion.

[4] St. Louis Hearings, pp. 18–19, 20, 23.

[5] Ibid., pp. 62–64, 137; Chicago Hearings, pp. 387, 424–427; Minneapolis Hearings, pp. 196–197.

[6] St. Louis Hearings, p. 62.

[7] 12 I. C. C. R. 569.

[8] 12 I. C. C. R. 568; Minneapolis Hearings, pp. 27, 66, 67, 69, 73, 74, 76, 86–87, 171; Chicago Hearings, pp. 309, 431; St. Louis Hearings, pp. 20, 25, 37; Kansas City Hearings, pp. 143, 195, 199, 200, 203.

[9] Minneapolis Hearings, p. 235.

stances, railway fuel was used by cities;[1] in others, business establishments were closed and coal was given out in sacks to keep people from freezing.[2] Action on the part of the Interstate Commerce Commission was necessary in securing coöperation of railway officials in charge of traffic to give priority to rush coal shipments into some sections.[3] Coal cars were put even into passenger trains.[4] All this evidence reads much like that which has been in the daily press since the United States entered the war; but it must not be forgotten that the situation here described existed more than ten years ago without any abnormal war traffic to move.

In attempting to determine the causes for the above described inadequacy of transportation facilities in time of peace, attention may be given to the growth of traffic in comparison with the expansion of the railway plant, to the significance of large areas producing raw materials, to the responsibility of the railroads themselves, to the shippers' contribution to the situation, and finally to the program of government regulation.

According to statistics of the Interstate Commerce Commission, the ton mileage of the railroads increased about 118 per cent in the eleven-year period, 1895–1905 inclusive; while during the same period, the increase in railway mileage was about 21 per cent.[5] Three-fourths of this new mileage was in new sections that merely added to the congestion of the old.[6] James J. Hill told the Interstate Commerce Commission in 1906 that the

[1] Minneapolis Hearings, pp. 93–94, 128–129.

[2] Ibid., p. 171; Chicago Hearings, p. 309.

[3] Minneapolis Hearings, p. 92.

[4] Ibid., p. 284, testimony of Howard Elliott. The experience in this section at this time contributed toward the priority given in 1917 to coal destined for points beyond the Lakes in order that an ample supply might be transported before the close of navigation.

[5] Statistics of Railways in U. S., 1905, pp. 12, 67–69.

[6] Minneapolis Hearings, p. 295, testimony of J. J. Hill.

commerce of the country and its growth was against a stone wall so high that it was not possible to see the top of it. He maintained that it was as impossible to bore an inch hole with a half-inch auger as it was to drive the business then being offered through the facilities which the railroads had.[1] Hill contended that conditions were growing worse; that there should be an addition to the railway mileage that then existed of from 25 to 33 per cent; that in addition, there would need to be much spent for new equipment, reduction of grades, double tracking, and terminal facilities. He believed it would be necessary to spend at least $5,500,000,000 during a period of five years to make the railroads equal to the task then before them.[2] That the railroads had more business than they could handle in 1906 is clear from the testimony of many railway officers in the investigation of the Interstate Commerce Commission at that time. The general manager of the Northern Pacific Railroad testified that in some instances they did not place cars in competitive territory, in the hope that the other railroads would take the business.[3] The third vice-president of the Rock Island Railroad stated that his road followed the practice of trying to get customers to ship over other roads.[4] The general superintendent of freight transportation of the Pennsylvania lines west of Pittsburgh stated that their agents were instructed to try to persuade shippers to ship by other lines.[5]

In the eleven-year period 1906–16 inclusive, the ton mileage increased nearly 60 per cent, while mileage

[1] Minneapolis Hearings, loc. cit., Howard Elliott made similar statements. Ibid., pp. 281–291. See also St. Louis Hearings, pp. 93–94; Kansas City Hearings, p. 215.

[2] Minneapolis Hearings, p. 296; St. Louis Hearings, p. 15; Kansas City Hearings, p. 185. See statement of Manager of Transportation Dept., Chicago Board of Trade, Railway Age, vol. 44, pp. 614–619.

[3] Minneapolis Hearings, p. 221.

[4] Chicago Hearings, p. 317.

[5] St. Louis Hearings, p. 91.

increased about 16 per cent.[1] In other words, it appears that the transportation plant as a whole has not kept pace with the growth of traffic. In the annual report of the Interstate Commerce Commission for 1916, it is claimed that whenever business generally is good and times are prosperous, there is widespread difficulty and complaint due to inability to secure satisfactory transportation services from the railroads. The Commission points out that this difficulty recurs during the fall and winter months of practically every year with regard to transportation of coal, and usually also in connection with the movement of grain when the crops are good.[2]

Inefficient and unsatisfactory railway service, however, may result from the improper use of facilities as well as from their insufficient supply, and it is this phase of the problem with which this article is concerned. Adequacy of the railway plant as a whole would not necessarily guarantee satisfactory service to different classes of shippers or to the different sections of the United States. Evidence has already been given (Maps I and II) which indicates that some sections of the country suffer very much more than others from a shortage of equipment. A fundamental reason for this is that this large country is roughly divided into areas which produce raw materials, and into sections which engage in various lines of manufacture. Areas producing bulky raw materials must have many cars to serve their needs for outbound loading; furthermore, the movement of cars under load into such areas is light, and therefore such areas of "one-way" shippers find it difficult to secure all the equipment they need. To this perfectly natural force, which tends to bring about a very unequal

[1] Annual Report I. C. C., 1916; table facing p. 74; Statistics of Railways in United States, 1906, p. 16; and Abstract Statistics of Steam Railways in United States (I. C. C. R.), 1916, pp. 2, 6.

[2] Annual Report I. C. C., 1916, pp. 67–68.

distribution of railway equipment and great inequalities in railway service, must be added several others. The railroads, the shippers, and regulating bodies are all responsible to some extent for this condition of affairs.

The general public has generally held the carriers responsible for inadequate transportation facilities. There is a widespread belief that railroads are accountable for the trouble because of a shortage of cars. It is a fact that certain railroads do not have adequate rolling stock.[1] Indeed some small railroads have no cars whatever, and they rely wholly upon their connections for equipment.[2] In one state in 1907, railroads having 10 per cent of the total mileage relied entirely upon other lines for their equipment.[3] In the late eighties, railroads sometimes made contracts to "furnish cars" used in traffic with other roads, the assumption being that the roads making the contract were to furnish their own cars; if they did not, they were to assume the mileage on any foreign cars used in this joint business.[4] Evidence indicates that railroads assumed, but in many instances did not pay, the mileage to the road that owned the cars.[5] In view of conditions in 1906 and 1907, it was natural that the American Railway Association, at its meeting in October, 1907, should have adopted a resolution that it was "a basic principle that ultimately every road should furnish sufficient equipment to take care of its local traffic moving within the confines of its own road, and also its proportion of all equipment required for through traffic."[6] The Interstate Commerce Commission through Commissioner Cooley early laid down the

[1] 1 I. C. C. R. 775; 12 I. C. C. R. 573; St. Louis Hearings, pp. 3, 4, 119, 120; Kansas City Hearings, pp. 184, 185.

[2] Proceedings National Association Railway Commissioners, 1912, pp. 243–244.

[3] 12 I. C. C. R. 574.

[4] Proceedings American Railway Association, vol. i, p. 183.

[5] Ibid., loc. cit.

[6] Ibid., vol. v, p. 37.

principle that it was the duty of the carrier to provide itself with rolling stock for the normal business which it proposed to carry.[1] It was contended in the Chicago Hearings [2] in 1906, that the Interstate Commerce Commission should be given power to compel a railroad to buy its proper share of equipment. One line ought not find it necessary to buy so much equipment that it would not have room on its own rails to store its own cars during periods of slack business.[3] But such inequalities between different systems would not necessarily indicate the insufficiency of the total supply.

Examination of Table I shows that the supply of rolling stock in this country has been ample except in certain seasons of certain years. From 1907 to 1916 it appears that there were five years in which there was no net shortage at all, and two other years in which the shortage was only nominal. In fact, only three years in this period show any marked lack of cars. According to facts presented by the American Railway Association, there were 423,183,191 idle car days on the railroads of the United States from 1906 to 1916; and counting the average earnings of a car as $2.50 a day, this would mean $1,057,957,977.50 as the loss to the railroads on account of dull times and hence idle cars during the ten years. There were 31,543,316 car shortage days in the ten years and, on the same basis, the loss to the railroads because they could not furnish cars was $78,858,-290.[4] If these figures are to be relied upon, it is clear that it is not to the interest of the railways as a whole to increase materially the supply of cars. It is a fact, how-

[1] 1 I. C. C. R. 722. [2] P. 360.

[3] Commissioner Hall testified before the House Committee on Interstate Commerce in 1916 that instances had come to the attention of the Interstate Commerce Commission of roads that did not have room on their own rails for their own cars during periods of slack business, and were obliged to store them on the ground. Each Hearings, p. 15.

[4] The American Railway Association Bulletin No. 6, February 6, 1917.

ever, that there were actually fewer cars in service in the United States in 1915 than in 1914, and fewer in 1916 than in 1915;[1] and this lack of equipment combined with an enormous war traffic has of course caused much embarrassment. In 1914 and 1915, the railroads did not buy the usual number of cars. In 1916, they were unable to secure them. Much railway equipment has been made in the United States for our allies, and some car manufacturers ceased to engage in the prosaic business of manufacturing railway equipment because of better opportunities in other lines.

Without attempting to minimize the importance of a shortage of rolling stock, which at times causes much embarrassment, it must be pointed out that the problem is one which involves much more than a mere deficiency of equipment. As Commissioner Lane indicated more than ten years ago, the problem of car shortage is one which is connected with every factor of railroading — the construction, operation, maintenance and financing. He rightly maintained that the problem of transportation is so closely interwoven with the fabric of our commercial organization that one may not lightly say what are the multitudinous considerations which necessarily enter into so simple a question as the reason why a car is not at once forthcoming when ordered. As he pointed out, the inability of the shipper to secure a car may be but a symptom of a deep seated and organic trouble.[2] Examination of Table I indicates that much attention which has been given to the subject of car supply might better have been given to the conditions which affect car operation.[3] In fact, at times when there has been

[1] The numbers were as follows: 1914, 2,325,647; 1915, 2,318,305; 1916, 2,298,263; Annual Report I. C. C., 1916, table facing p. 74; I. C. C. Abstract of Statistics of Steam Railways in the United States, 1916, p. 3.

[2] 12 I. C. C. R. 574–575.

[3] See statement of J. J. Hill, Minneapolis Hearings, p. 298; Proceedings National Association Railway Commissioners, 1912, pp. 246–247.

most embarrassment because of the insufficiency of transportation facilities, it has resulted more from congestion in terminals and on side tracks than from car shortage.[1] At such times more cars would have made conditions worse instead of better, for additional equipment would merely have added to the congestion.

The problem of car operation has been increasing in significance as our commerce has become more interstate in character, and as the relation of the railways to each other in the handling of traffic has become more complex. When our railways were first built, the question of exchange and interchange of railway equipment was not an important one. The lines were then short and disconnected. They served a local community only, and as a rule equipment did not go beyond the termini of the home road. Indeed, railroads were built on different gauge in order to keep cars on the home track, and some states framed charters designed to prevent through routes so as to keep the business within their borders.[2] In view of these primitive conceptions and conditions, it is not surprising to learn that an early decision of the Interstate Commerce Commission upheld a railroad which refused to furnish cars for points beyond its own line. This decision was based upon the theory that local traffic enjoyed rights superior to through traffic. The Commission observed in this case that " if this company (Pittsburgh and Lake Erie Railroad) should send its cars . . . to Buffalo, . . . this

[1] See statement of Commissioner Clark before the Chicago Traffic Club, Railway Age, November 1, 1907, pp. 614–616; statement of J. J. Hill, Minneapolis Hearings, p. 295; see also ibid., pp. 311, 318; Proceedings National Association Railway Commissioners, 1912, pp. 246–247; 12 I. C. C. R. 564; Annual Report I. C. C., 1916, p. 68; address of Howard Elliott, Proceedings Railway Development Association, November, 1915, pp. 25–32; St. Louis Hearings, p. 15; Kansas City Hearings, p. 216. Space does not permit of a discussion of the vital problems of railway service in terminals, and of the coördination of rail and water carriers. These subjects must be left for future consideration.

[2] McPherson, Railroad Freight Rates, pp. 161–162.

would have stripped this railroad of its equipment, leaving the other business along its line to go to ruin. . . ." The Commission contended further that the railroad's " first and most paramount legal duty to the shipping public was to make its entire freight equipment do its utmost in serving the shippers along its own line. . . ." [1] With the growth of the country, it has been necessary to develop standard gauge [2] and to consider railroad equipment something like a negotiable instrument. It is now imperative that cars be sent freely from one system to another, hence the vital importance of equitable car service rules and their honest observance.

When carriers began to interchange equipment in through traffic, they paid for it on a mileage basis. This led to great abuses. The method of computing mileage often made it impossible for a railroad to get any pay for the use of its cars in the local service of another railroad, and such local usage was widely practiced.[3] There was much dishonesty in making reports, and foreign equipment was much used for storage purposes under the mileage plan. Finally in 1902, this basis gave way to the per diem method of payment.[4] As soon as this system went into effect, the committee on car service of the American Railway Association was able to report improvement in the return of cars to their owners, which resulted in an increase in the available car supply.[5] The

[1] Riddle, Dean & Co. v. Pittsburgh & Lake Erie R. R. Co.; 1 I. C. C. R. 688 (693).

[2] Altho the standardisation of the gauge of American railroads was carried out principally between 1860 and 1870, the standing resolution of the American Railway Association that the standard gauge should be 4 ft. 8½ in. was not adopted until April 7, 1897. Proceedings, vol. vii, p. 1220.

[3] Ibid., vol. i, p. 183.

[4] Ibid., loc. cit.; for summary of objections against the mileage basis, see ibid., vol. ii, p. 748; history of per diem from its proposal, April 25, 1900, to its final adoption is given in ibid., vol. iii, pp. 160–168, 198–215, 251–263, 279, 280, 292, 410–415, 434, 435, 552–595, 1019–1024.

[5] Ibid., vol. iii, p. 1039.

per diem was twenty cents per day in the beginning, but it has been modified from time to time in an attempt to make it to the interest of carriers to return equipment promptly. But even increased per diem charges do not return cars when there is a great demand for them and when it is profitable to use foreign cars in local service.

Statistics of car location (Maps I and II) show that cars accumulate in certain sections of the country in certain months of the year. As has been suggested, this is the result in part of traffic taking its normal channels, but it is also due to the fact that car service rules are honored more in the breach than in the observance when there is much demand for equipment. The railroads frankly confessed this fact before Commissioner McChord in the Hearing at Louisville, Kentucky, in November, 1916.[1] The record in this hearing shows that the Car Service Commission of the American Railway Association found over 40,000 violations of car service rules in the month of June, 1916, and that the evidence was so overwhelming that further inspection was abandoned.[2] Such a practice on the part of the railroads places a great burden on those sections of the country which, as has been indicated, produce mainly raw materials, the sections which normally load much freight out but receive little inbound freight. Whenever there is a heavy demand for cars, such sections suffer much from car shortage, for they cannot provide themselves with empties like sections that are receiving a constant stream of cars under load. It is evident that the " one-way " shippers are dependent upon a fair observance of car service rules for a supply of equipment.

The effect upon the railways in such regions is equally apparent. Railway systems in the West suffer severely

[1] Car Supply Investigation, House Doc. 2116, 64th Congress, 2nd Session, p. 8.

[2] See testimony of Commissioner Hall, Esch Hearings, pp. 36–37; also Traffic World, November 11, 1916, p. 956.

from lack of equipment, regardless of their original supply. Their cars, which are loaded and destined to the Atlantic ports, are often used for local business there or are loaded and sent back to some point, say in Trunk Line or Central Freight Association territory, and unloaded only to be reloaded and sent again to the Atlantic coast. In 1906, James J. Hill sent a representative of the Great Northern Railroad to the East to discover where Great Northern equipment was being detained. The representative found that their equipment was being used to haul ice from Maine to Boston and that these cars had "been in that service for months and months." [1] Thus, through the disregard of car service rules, the cars of railway systems west of the Mississippi River shuttle back and forth throughout the eastern portion of the United States. Coal mines as well as producing areas belong to the unfortunate group of one-way shippers. Consequently railroads which serve coal mines often find it difficult to secure the return of coal cars that go beyond their own lines. A typical case of this sort came before the Interstate Commerce Commission in 1910. The superintendent of transportation of the Illinois Central Railroad had attempted to secure an agreement from a number of connecting roads that they would observe car service rules and return coal equipment promptly. The reply of the Missouri Pacific is typical.

[1] Testimony of Hill, before the Interstate Commerce Commission, Minneapolis Hearings, p. 300. Little wonder that Hill should say: "The car thief is the worst kind of a thief. Thieves are all bad but I think the car thief is the worst." Ibid., loc. cit. See also discussion upon the adoption of the per diem method of payment before the American Railway Association in Proceedings, American Railway Association, vol. iii. p. 565.

A little road in Iowa about 100 miles long said to have the largest amount of cars per mile of any railroad in the United States has had much trouble in keeping equipment adequate to their needs because they ship out clay and gypsum products that go to distant points, and the number of cars that come over their system under load does not correspond with the number they ship out, hence in a time like the last two years they have much trouble from car shortage. (See a statement of E. D. Chassel of the Railroad Commission of the state of Iowa, Hearings before House Committee on Interstate and Foreign Commerce, 64th Congress, 2nd Session, on H. R. 19546, etc., p. 58.)

That railroad indicated that it would be glad to observe the car service rules, unless they were disregarded by other lines. In that event it would be compelled to confiscate whatever cars it found upon its lines. The Illinois Central finally issued an order to the effect that none of its cars could be loaded with coal destined for points beyond its own lines. Whereupon the Missouri and Illinois Coal Company, which was thereby prevented from marketing coal on its contracts in St. Louis, appealed to the Interstate Commerce Commission for relief. Reversing the earlier decision [1] it was held that the action of the Illinois Central was illegal; but the Commission made no order in the case, indicating that it was the first duty of the carriers to work out equitable car service rules among themselves.[2] Clearly the refusal of railroads to observe their car service rules has meant inequity in car distribution not only among different shippers and different sections of the country but also among the railroads themselves. Such practice on the part of the carriers gives little incentive to any individual line to increase its car supply. Railways are, however, not altogether responsible through non-observance of car service rules for the fact that railway equipment becomes congested in some sections and lacking in others. Both shippers and regulating bodies share this responsibility.

The responsibility of shippers for the inability of carriers to render adequate service is greater than has commonly been recognized. Among the practices of shippers which contribute to the inadequacy of transportation facilities may be mentioned the detention of equipment longer than is necessary to unload it, the use of cars for storage purposes, the abuse of the reconsignment privilege and finally by continuing trade customs

[1] See p. 150, note 1, supra. [2] 22 I. C. C. R. 39 (41).

that should have changed *pari passu* with enlarged capacity of railway equipment. These practices have meant an inefficient use of equipment. Bad habits of American shippers have been developed to a great extent by competition between carriers. For some years American railroads were built out into territory where nobody lived, and from that point on out to where nobody cared to go.[1] Because of the excess of transportation facilities it was natural that competition between carriers should have brought about very liberal use of railway equipment by shippers. Some railroads had ample warehouse or storage room which they gave free to shippers in order to get their business. Others that did not have storage room offered their cars or as was often the case the cars of other railroads.[2] As late as 1887 when the board of directors of the New York and New England Railroad reluctantly permitted the vice-president and general manager of that road to levy a demurrage charge on shippers for detention of equipment, the competing lines with the exception of the Boston and Albany began soliciting New England patrons with promises of unlimited car storage.[3] Altho earlier attempts [4] than that of the New York and New England Railroad were made to levy a demurrage charge for detention of equipment by shippers they do not appear to have been taken seriously,[5] especially so far as it affected big shippers [6] or competitive points.[7] In fact any one railroad found it very difficult to insist upon payment of demurrage without a loss of business,

[1] See an article by Charles Francis Adams, North American Review, April, 1875.

[2] Chicago Hearings, p. 337; see St. Louis Hearings, p. 140; Proceedings National Association Railway Commissioners, 1909, p. 214, and 1914, pp. 41–42.

[3] Railway Age, February 8, 1907, p. 171.

[4] Ibid., loc. cit.; also Railroad Age Gazette, October 30, 1908, pp. 1234–1236.

[5] Proceedings National Association Railway Commissioners, 1909, pp. 236–237, 240.

[6] Ibid., p. 221.

[7] 18 I. C. C. R. 38; 25 I. C. C. R. 216. Proceedings American Railway Association, vol. i, p. 173.

and car service associations were finally formed to collect[1] for all railroads. Even then shippers resisted payment of these charges and carried their cases to the Interstate Commerce Commission but without success.[2]

The extent to which shippers use railway equipment for storage purposes is difficult to measure. Reporting upon evidence presented in the investigation of the Interstate Commerce Commission in 1906, Commissioner Harlan pointed out that both railroad men and shippers admitted that cars were constantly used by shippers as warehouses, and that the time allowed to them for loading and unloading was in excess of real necessity.[3] Naturally through liberal treatment of shippers on the part of railways in the use of railway equipment, habits were developed of relying upon the railway to furnish much of the "business plant." The very rapid development of our commercial centers has contributed not a little to the insistent demand on the part of the shipping public for a continuation of early privileges in the use of the railway equipment in connection with their business. Inasmuch as land has ad-

[1] List of demurrage bureaus, see Bull. 191, U. S. Dept. of Agriculture, March, 1915, p. 24.

[2] 11 I. C. C. R. 166; see also 18 I. C. C. R. 234.

[3] 12 I. C. C. R. 579. Commissioner Lane said that the contention that car shortage had been caused by the use of cars as warehouses was without support so far as the testimony given at Minneapolis and Chicago indicated. He maintained that the demurrage accounts of the railroads showed that to a very limited extent did "consignees avail themselves of the right to hold cars as warehouses and pay demurrage thereon." 12 I. C. C. R. 571. While this might be true as applies to agricultural areas to apply it generally would appear to overlook the fact that even in more recent years demurrage accounts might not be a true measure of the extent to which shippers were holding cars. J. A. Shinn writing in the Railway Age (February 8, 1907, pp. 171–172) maintained that in 1893 it was notorious that many big firms owed tens of thousands of dollars which was not paid and which no attempt was made to collect. Even as late as 1909, the Committee on Car Service and Demurrage of the National Association of Railway Commissioners reported that the collection of demurrage from large industries was still somewhat of an anomaly; that in some sections of the country the railroads were carrying on their books uncollected demurrage of hundreds of thousands of dollars; that the failure to enforce demurrage rules had been "particularly notorious." Proceedings National Association Railway Commissioners, 1909, pp. 221, 240. If these statements are to be relied upon it is fair to assume that an important portion of demurrage was never even placed upon the books. See also American Railway Association (Bulletin) February 6 and May 9, 1917.

vanced in value very rapidly in our cities, it h
cheaper to rely upon the carriers for adequate
and track space than to provide it otherwise
charge for the use of railway equipment has
vanced in the same ratio that the value of rea
has risen; indeed the charge for detention of
equipment had remained almost stationary u
cently advanced by the Director General of Ra
Even those business concerns, which a generat
had sufficient storage or track space, have found
nomical to use this space for enlarging their ca
leaving the burden of their enlarged capacity u
carriers.[2] This applies to the shipping in of larg
of raw materials bought under favorable mark
ditions as well as to the daily output of a concer
case in the former class which came before th
state Commerce Commission as late as 1912, the
resisted the payment of demurrage, but the In
Commerce Commission very properly held tl
demurrage should be paid.[3] When the railroads
to the Interstate Commerce Commission a little
year ago for permission to reduce free time on d
freight held in New Jersey for final delivery
York, Brooklyn and elsewhere, and for permis
increase the charge for storage for both exp
domestic delivery at New York harbor points,
measure was for the purpose of increasing reve
to relieve freight congestion.[4]

In the case of some concerns which have ac
storage, their facilities for unloading may be so
tive as to occasion much delay to railway equi

[1] See 14 I. C. C. R. 170; 16 I. C. C. R. 116; Proceedings National Associ
way Commissioners, 1913, pp. 367–368.

[2] See Chicago Hearings, p. 358.

[3] 25 I. C. C. R. 399.

[4] Newlands Hearings, p. 900.

The evidence reflected in Map II appears to reveal that the economies sought by the railroads in building self-dumping coal equipment are to a large degree offset by the fact that many consignees do not have proper facilities for unloading such cars. Investigation was made by a railroad company that found its coal cars were being unduly detained; and it was told by dealers in Kansas, Oklahoma and other states that it was cheaper for them to hold the cars and pay five or six days demurrage than it was to unload the coal in bins and reload it again in wagons.[1]

It is clear that railway competition, together with early liberal precedents, makes it difficult for railways to put wholesome pressure upon shippers to provide their own storage.[2] For more than twenty-five years the Lehigh Valley Railroad Company provided in its tariffs that cars containing anthracite coal forwarded to Perth Amboy for transshipment by boat and held at that port would not be subject to demurrage; it was further provided that free storage in bins would be given for a period of two years to such shippers. But the Interstate Commerce Commission upheld the Lehigh Valley in 1915 in its refusal to continue to furnish free storage bins, or to permit cars to be detained without demurrage charges.[3] The Interstate Commerce Commission has held that the carrier has a right to unload car load freight at the end of free time in order to secure its equipment,[4] but this in practice is often very difficult for the carrier to do in congested terminals, where the need is greatest for releasing equipment.

Abuse of the reconsignment privilege has become important in recent years through a substantial increase

[1] Kansas City Hearings, p. 259.
[2] 41 I. C. C. R. 506; 43 I. C. C. R. 472.
[3] 36 I. C. C. R. 140; see also 37 I. C. C. R. 441.
[4] 18 I. C. C. R. 234.

in the number of commission men and brokers,[1] who have relied almost entirely for their "business plant" upon the railway. But such a practice is by no means a new one. The manager of the Railway Clearing House Association of Boston observed in 1888 as follows: "When one sees with what coolness a man hires desk room in an office and starts out in the grain, lumber or coal business without a storehouse of any kind, no lumber or coal sheds or a square foot of yard room anywhere, trusting entirely to the railway companies to substitute their cars for storehouses and sheds, *charging him nothing*, one is lost in amazement."[2]

Reconsignment may be necessary in some cases because of the uncertain or slow movement of trains.[3] This is especially true of fruits, vegetables, or other perishable commodities. Shippers may resort to reconsignment to keep their list of customers from their competitors,[4] or to escape demurrage charges.[5] Finally, it is considered necessary because of certain trade conditions, which in many instances have been brought about through the use and abuse of reconsignment itself. In investigations made in 1917 at New York, in regard to food speculation, it was learned that car loads of perishable foodstuffs were sometimes sold a dozen times and

[1] A car service manager testified before the Interstate Commerce Commission in 1906 that middlemen had increased from two to five times but that they had not increased their facilities. (St. Louis Hearings, p. 141.) Both the mushroom expansion of many business concerns as a result of the war, and also the indefiniteness of the future, have caused many establishments to depend entirely upon the railway plant for storage facilities. Freight equipment has been used as coal bins from which the daily supply has been taken. The statement was made before the Esch Committee that owing to lack of storage facilities Detroit has but a three days' coal supply on hand. (Esch Hearings, p. 27.) Much evidence along this line was given in hearings before the Public Utilities Commission of Ohio in February, 1917.

[2] Proceedings American Railway Association, vol. i, p. 184. See also 12 I. C. C. R. 571. Proceedings National Association Railway Commissioners, 1913, pp. 362–363 Railway Age, December 28, 1906, p. 802.

[3] Kansas City Hearings, p. 268. Chicago Hearings, p. 433.

[4] Kansas City Hearings, p. 256.

[5] See Proceedings National Association Railway Commissioners, 1914, p. 42.

nearly every time they were sold a reconsignment was made.[1] The handling of grain and other commodities through a third party or commission house has created laws providing for inspection either by state or regularly authorized boards of trade, and the tariff governing demurrage has conceded the right and allowed free time for inspection. Instances have been cited of grain which moved through fifteen different markets, being subject to official inspection at each of the markets before it was ultimately unloaded.[2] It was contended before the National Association of Railway Commissioners in 1913, that 90 per cent of the grain tonnage was handled through so-called commission firms that had very little if any storage room of their own.[3]

Like other privileges enjoyed by shippers, reconsignment had its origin in the days of fierce railway competition when traffic was not so plentiful as it has been in recent years.[4] Furthermore, railway competition has extended the time for reconsignment in many cases beyond what is necessary.[5] Shippers unfortunately do not fully appreciate that with a change in conditions insistence upon what they have come to consider as a right is after all the abuse of a privilege which results in injury to themselves. That the Interstate Commerce Commission has always looked upon reconsignment as a

[1] A car load of potatoes was sold to a New York jobber and by him sold to a Chicago jobber, and the car reconsigned to Chicago: the Chicago jobber sold it to a Cincinnati dealer and the car was reconsigned to Cincinnati: the Cincinnati dealer sold it to a Cleveland dealer and the car was reconsigned to Cleveland, and so the thing went on through half a dozen more transactions covering a period of more than thirty days, meantime the car itself was standing in the yards in one of the upstate cities of New York. Railway Age, August 31, 1917, p. 370.

[2] National Association Railway Commissioners, 1913, pp. 361–362; see also Esch Hearings, p. 11; St. Louis Hearings, pp. 114, 123. It has been contended that much terminal delay could be eliminated by providing as far as possible for inspection of grain before shipment. Kansas City Hearings, p. 265.

[3] Proceedings National Association Railway Commissioners, 1913, p. 361.

[4] Railway Age, October 5, 1906, p. 415.

[5] Proceedings National Association Railway Commissioners, 1909, pp. 220–221; 12 I. C. C. R. 571.

privilege, not as a right, is clear,[1] and this body has not been slow to condemn the abuse of this privilege. The Commission has maintained that it is worse in its effects than rebates.[2] The president of an important belt line railway testified before the Interstate Commerce Commission that reconsignment is the largest factor in terminal delays.[3] Testimony given in the Louisville Hearings in November, 1916, was to the effect that car shortage on the Illinois Central Railroad would have been reduced one-half if cars held for reconsignment had been released.[4] Beyond doubt a considerable amount of traffic which blocks sidings and congests terminals should not require the reconsignment privilege; it is manifestly unfair that a consignee who is able to receive his freight promptly should be prevented from doing so because traffic held for reconsignment congests yards, sidings, and terminals. Just as the disregard of car service rules among carriers gives little incentive to any one road to provide ample facilities, so does disregard of car service rules between railroads and shippers leave little incentive to a shipper to provide adequate facilities for handling his freight; it even puts a premium on the " shipping-to-order " practice.

Trade customs relative to commercial units have meant an inefficient use of railway equipment. Orders have been given for the same amounts that were customary when the capacity of railway equipment was much less than it is now. Within a ten-year period the number of freight cars increased 37 per cent while the load carrying capacity increased 60 per cent. Statistics of the Interstate Commerce Commission indicate that this

[1] 16 I. C. C. R. 387.

[2] Railway Age, February 8, 1907, p. 171.

[3] Chicago Hearings, pp. 410–411; St. Louis Hearings, pp. 122–125; Traffic World, November 11, 1916, pp. 962–966.

[4] Ibid., November 18, 1916, p. 1006.

increased capacity has not been utilized.[1] In June, 1917, the Railroads' War Board pointed out that the average car load was but 15.5 tons or only 42 per cent of the average capacity of cars.[2] The excellent records of maximum loading since that time show what might be possible even without the spur of patriotism.[3] But it would appear that as long as shippers continue the practices which have just been described it will be impossible to determine with any degree of certainty the need for transportation facilities.

Those who represent the interests of the carriers have been as ready to contend that government regulation is responsible for inadequate transportation facilities as the public has been to lay the responsibility upon the railroads. It has been claimed that the return to the railways has not been sufficient to enable them to furnish the facilities which are needed.[4] The Interstate Commerce Commission and the state commissions have hesitated to grant increases in railway rates probably because they have feared that an increase in railway income would induce an increase in railway capitalization; and that increased capitalization in turn would be presented as justification for another increase in rates. The vicious circle ought to be broken by increased knowledge of the value of the railway plant combined with supervision over the issue of railway securities. The public cannot afford to pay less for transportation than it costs to produce it. But this discussion is concerned with the efficient and maximum use of facilities, once they are provided. Indeed such use even determines the supply of facilities which will be needed.

[1] Table facing p. 74. Ann. Rept. I. C. C., 1916.

[2] Railroads' War Board, Official Public Bulletin No. 7, June 26, 1917.

[3] Much valuable information in American Railway Association Bulletins.

[4] This has been emphasized in the program of the railroads as presented in the Newlands Hearings. For statements of A. P. Thom, see pp. 213, 214, 218; Judge Lovett, pp. 682–684; Julius Kruttschnitt, pp. 892, 866–968, 972–973.

federal regulation has doubtless interfered with the proper use of railway facilities. The prohibition of pooling by the act to regulate commerce and the application to the railroads of the theory embodied in the Sherman law has made it difficult to use the railway plant in an economical manner. The Panama Canal Act has not been conducive to economy and efficiency in the operation of rail and water systems. The right of the shipper to route his freight as he has wished has meant much economic waste in our transportation. But federal legislation, or as will appear presently the lack of it, is not the only hindrance to efficient and sufficient railway service. State laws also, which have regulated railway operation and service, have prevented an equitable and economical use of railway facilities.

Some states have attempted through legislation to give shippers within their borders an advantage over their competitors in other states. This can be done by low intrastate rates, but it may make such inroads on railway revenue that a carrier will have insufficient funds to provide adequate facilities. Judge Lovett testified before the Newlands Committee that the increase in rates given by the Interstate Commerce Commission at the beginning of the European War was practically offset in the state of Pennsylvania by reduction of the rates on coal to tidewater points.[1] Carriers may be prevented from financing their properties to advantage by state regulation of security issues.[2] Complaint was made before the Newlands Committee that the New York Central, which has only a total right of way in Illinois of about 140 miles, altho it operates 6034 miles of first track, was taxed $600,000 by that state as a condition precedent to its approval of an intended financ-

[1] Newlands Hearings, pp. 716–717.

[2] Ibid., pp. 76, 98, 109, 894, 927–928.

ing; also that Arizona in return for approval of an issue of securities asked that litigation concerning passenger fares be dropped and that a new station be built at Phoenix.[1] The Hadley Commission, in commenting upon state regulation of security issues, said they believed the time was near when the difficulties of the present system of dual control, and the conflict of state laws would become so manifest that further legislation would be imperative.[2]

State industries may be favored by legislation regulating directly the service which carriers must furnish to shippers. A state that fixes low car load minima may benefit some of its industries but it will absorb more than its fair share of railway equipment. Likewise if one state gives much free time to shippers this means that equipment is detained and shippers in other states are deprived of its use. C. F. Staples, member of the Minnesota Railroad Commission, told the National Association of Railway Commissioners in 1909 that he could readily understand why no railroad in Minnesota would permit one of its cars loaded with flour to go down into the New England states, for there they permitted four days free time for unloading, which of course meant much delay to Minnesota farmers who were clamoring for cars.[3] It is evident, too, that anything which increases detention of equipment at the same time increases the aggregate supply which is necessary to move a given tonnage. The unsatisfactory character of regulation of demurrage by the separate states brought about the adoption of a uniform demurrage code by the National Association of Railway Commissioners in 1909

[1] Newlands Hearings, p. 928, see also pp. 76–84.

[2] Rept. of the Railroad Securities Commission, House Doc. No. 256, 62nd Congress, 2nd Session, p. 8.

[3] Proceedings National Association Railway Commissioners, 1909, p. 277. See the statement of a member of the Minnesota Railroad Commission before a Senate Committee in 1917. Hearings, S. 636, May 3, 1917, p. 19.

and the Interstate Commerce Commission ap
this code the same year. The year following it
proved by the American Railway Association.
ing to a bulletin of the United States Departm
Agriculture published in March, 1915, there were
time twenty-four states that had adopted the
code for intrastate traffic, and in the other
four altho there was a tendency to conform more
to the provisions of the uniform code, the exc
thereto and the number of special provisions
state codes were important.[1]

Following the acute conditions in 1906 and
about twenty states passed so-called reciprocal
rage laws. Similar legislation was introduced in
gress,[2] and the Interstate Commerce Commissi
asked to make a ruling governing reciprocal dem
but it held that it had no authority to make
rule.[3] Such legislation requires railroads to supp
pers with cars on penalty of so much per day f
car not furnished. Some of the state laws were
in such a way that they were declared illegal, a
tunately the decisions of the courts brought li
forcement of the legislation in many other stat
in some the legislation has been repealed. Asi
the weakness of such a law, were it applied gene
have it in some states and not in others, mean
ference with interstate commerce and an uneq
tribution of equipment among states. It puts a p
upon the retention of a carriers' cars upon its o
and hence under its own control, which in tur
feres with free exchange and interchange of equi
In view of this fact it might not be worth while

[1] Bulletin No. 191, U. S. Dept. of Agriculture.

[2] For a copy of a bill (S. 3644) and hearings on same, see Sen. Doc. N
Congress, 1st Session, pp. 1–134, and appendix of five tables.

[3] 12 I. C. C. R. 61.

nish a shipper with cars that could not be sent beyond the termini of the originating road. The application of such a law means, therefore, that shippers would find their markets curtailed. In other words the application of such a law within the borders of a state means that shippers within that state, engaged in interstate commerce, would have difficulty in securing a fair share of railway equipment.[1]

Our early railway legislation prohibited discrimination on the part of the railways. It is equally important to eliminate discrimination which results from state regulation. Regulation by some states makes it difficult, in some cases impossible, for carriers to furnish equitable and adequate service. In the middle 70's when the Windom report was made to Congress there was a demand for low freight rates. That was natural in view of the economic conditions which obtained at that time. About ten years later the Cullom report brought discrimination in freight rates to the fore. And now within the last decade the growth of traffic beyond the capacity of the railway plant and the lack of proper control of railway service have brought the shipping public to a realization of the fact that adequate and non-discriminatory service is as important as low or non-discriminatory rates. This is reflected in the recent Esch and Pomerene Reports. Shippers appeared before the Interstate Commerce Commission in the Fifteen per cent rate case and expressed their willingness to see an advance in freight rates, in the hope that the railways would be able to render better service. From the foregoing analysis it would appear that something more is required than an increase in railway facilities. What is

[1] Aside from the extent to which such legislation interferes with interstate commerce and the free exchange of railway equipment it is easy to see how it would lead to rebating if the one receives the penalty who is supposed to be damaged by the fact that equipment is not furnished.

needed is a thorogoing control of railway service. This is necessary whether the railroads are restored to private operation, continued under some plan of government operation, or taken over by the government through government ownership.

If the railroads are to be restored to private operation our government regulation ought not compel the carriers to compete. Most students of transportation are agreed that there would be a distinct advantage in the repeal of our legislation which prevents pooling and combination among carriers, provided there be adequate supervision and control of such combinations. Those who argue for the railroads have contended that the repeal of such legislation would have made government operation of railroads unnecessary; that the breakdown was one of government regulation rather than of railroad administration.[1] If this be granted, it implies more than railroads will desire to accept. The character of railway service from about 1900 to the present time indicates that something more than mere *permission* to carriers to pool and form combinations is necessary. The repeal of the federal legislation referred to would not be sufficient. A railroad like any other business interest will combine with others when it is to its advantage to do so, but when a carrier occupies a strategic position in the use of terminal or other facilities, it is not probable that it will offer to share this monopoly advantage with other carriers. It may be to the interest of the public, therefore, not only to *permit* but to *compel* certain combinations among carriers in rendering service.[2] There is as much logic in compelling one carrier to permit the use of its

[1] See editorials in Railway Age; also Regulation of Railways by S. O. Dunn (Appleton, 1918) reviewed by the writer in Journal of Political Economy, October, 1918.

[2] See a statement by Senator Cummins, Hearings, S. 636, May 3, 1917, p. 26; see also article by Professor Van Metre, New Republic, February 2, 1918, pp. 17–20.

facilities by another carrier as there is in compelling one utility to permit the use of its poles, conduits, or other facilities by another utility. In both cases the public receives consideration as an important third party to the contract. The theory in the decision of the Supreme Court in the St. Louis terminal case (1912) ought to be more generally applied.[1]

In the regulation of railway service the Esch-Pomerene law, which became effective May 29, 1917, is but a beginning in the right direction. This legislation gives the Interstate Commerce Commission control over " car service " which term is defined by the law to include " the movement, distribution, exchange, interchange, and return " of cars used in the transportation of property by any carrier subject to the provisions of this act.[2] It is not easy to appreciate why such a law was not passed some years earlier.[3] System control of what must be inter-system equipment was too long tolerated. When the American Railway Association worked out car service rules in 1900 much emphasis was placed upon ownership as the proper criterion for the return of equipment.[4] The same theory is found in the order of

[1] 224 U. S. 383.

[2] Statutes of the U. S., 65th Congress, 1st Session, 1917, chap. 23, pp. 101–102.

[3] See a review by the writer of the Special Report of the Interstate Commerce Commission for 1917 in American Economic Review, March, 1918.

[4] The rules were presented to the Association by its Car Service Committee in April with the suggestion that the expression of the Association or of members thereof be given and that the rules with suggestions be referred back to the committee for reconstruction and recommendation to the Association in its October meeting. Rule 3 as originally presented by the committee had provided that a car should not be delivered to a second railroad without consent of owner. The Association voted that " without consent of owner " be eliminated. The committee, however, did not take this as binding upon them, and reported the rule in October " with consent of owner " inserted. Discussion at some length followed concerning the recognition which should be given to ownership of a car and the extent to which the needs of traffic and the reduction of empty car mileage ought at times to control in the exchange and interchange of equipment. By a very close vote the Association decided that the interests of the car owner should be considered first. (See Proceedings, vol. iii, pp. 161 et seq. and 251 et seq. The rules as adopted October 24, 1900 are found in Proceedings, vol. iii, pp. 279–280.) In the October meeting in 1901 amendment was made to rule 3, to permit one railroad to deliver a foreign car either loaded or empty to another railroad for switching service but that its use was to be confined to switching service and its return made either to

the Interstate Commerce Commission of January
But the theory is not a sound one. Its appl
means much unnecessary switching, delay to s
in securing equipment, and an undue amount of
car mileage. It is often difficult to get cars out
gested terminals, even disregarding ownership.
winter of 1917 the Pennsylvania Railroad Com
some instances used a crane to lift cars bodily fr
track to another rather than switch them throug
of congested yards.[2] When the Railroads' War
was created, this body modified the plan of re
cars to owners; and for some classes of equipme
simply based the number each road was to receiv
the number it owned. The United States Railro
ministration has gone further in the same directio
economies in pooling railway equipment are clea
the railways are relinquished to private operatio
the war a plan ought to be worked out which w
tinue the pooling of equipment and compel each
to furnish its fair proportion of the total supply
formation of separate corporations which wou
all equipment and lease it to the railroads
doubtless make a satisfactory organization t
which government control could be made ef
Under some such plan railroads which have n
vided themselves with sufficient equipment co
held to a strict accountability.

But there is also the question of car servic
applies between railroads and shippers. This th
Pomerene law does not cover except in an i

the home road or the delivering road. A new section (No. 15) was adde
switching service. Again amendment was offered to permit loading a car i
site direction of the home road. Much warm discussion followed and it
that this would open the door to the use of foreign cars in local service, esp
state like Connecticut which allowed 96 hours free time. The Association
adopt the amendment by a vote of 18 to 28. (Proceedings, vol. iii, p. 410

[1] 42 I. C. C. R. 657.

[2] Testimony of Commissioner Hall, Esch Hearings, p. 17.

manner. As has been indicated there is a wide variety of practice on the part of railways in their transactions with shippers, depending sometimes upon competition between carriers, sometimes upon state legislation. When, for example, increased demurrage has been applied by one carrier, or by the carriers in one state, altho it has produced desirable results in releasing equipment more promptly, it has been difficult to maintain the advanced scale because of the lower demurrage charges of other carriers, or because of a lower scale enforced in a bordering state. This has meant unfair distribution of equipment between shippers and between states. Julius Kruttschnitt has pointed out that the average detention of equipment for a given period by consignees in Oregon was about 50 per cent greater than in California where demurrage charges were much higher.[1] It would appear therefore, that the Esch-Pomerene law will be ineffective, even within the narrow scope of car service which it is designed to cover, as long as the separate states have laws and commission rulings which are wholly independent of and inconsistent with orders which federal authorities may care to make. The commerce of this country has become so complex that intrastate regulations cannot be enforced without great detriment to the shipping public generally; and to quote the Hadley Commission "It is a matter of direct concern to the federal government that the facilities for handling commerce between the states should not be impaired."[2]

Two obstacles will be encountered in attempting to take power over railway service from the states and give it to the federal government. One of these difficulties is legal, the other is political. Those opposed to an extension of federal control will contend that the federal government has no right to exercise control over intrastate commerce, but in view of the Shreveport doctrine

[1] Newlands Hearings, p. 923. [2] Rept. Railroad Securities Commission, p. 8.

which has been set forth in a number of cases it is not probable that the legal obstacle will be insurmountable. It will doubtless become increasingly clear to the courts that state regulation of intrastate commerce is impossible without at the same time affecting materially interstate commerce. According to testimony before the Newlands Committee about 85 per cent of all traffic is interstate.[1]

The political difficulty in the way of the adoption of federal regulation of railway service is concerned with centralized *versus* local control. It will be contended that a centralized control cannot be sufficiently familiar with local conditions to be effective and efficient. There is much to be said for this objection. The United States Railroad Administration began with a Director General of Railroads. Gradually this administration has decentralized. Regions have been established, and these in turn have been further subdivided. It has apparently been realized that first hand information is important in conducting a railroad successfully. The predominance of the divisional type of organization found on American railroads is further evidence of the value of knowledge of local conditions. If there is to be control of railway service, first hand information concerning operating conditions would appear to be indispensable. How then can the disadvantage of state regulation be eliminated and yet retain the advantages which come from intimate association with actual conditions. Possibly this could be done by some plan which would permit the states to coöperate with the Interstate Commerce Commission but which would make the orders of the federal commission paramount. A better plan and one which has the support of an increasing number of students of transportation, would be to divide the country into a number of regions, something

[1] Hearings, p. 78, testimony of A. P. Thom.

after the plan of the federal reserve banking system. These regions should in size and shape conform to traffic conditions. Such regions would, therefore, ignore state lines. It would then be logical to establish commissions for these regions. State commissions would not necessarily be discontinued but could give their time to public utilities within the state; possibly they could be of value in an advisory capacity to regional commissions. It may be contended that such a proposed decentralization of regulation indicates clearly that the present decentralized plan should not be disturbed. But the present plan of arbitrary state lines, in no sense coincides with traffic needs, and regulation of railway service by the various states seriously interferes with interstate traffic. The proposed plan would be sufficiently elastic to take advantage of the knowledge of local conditions and at the same time it would be possible to work out more equitable rules and regulations affecting railway service, among railroads themselves, and between railroads and shippers.

If we assume that as a result of our experience during the war, government ownership should be adopted in the United States or that some form of government operation be continued, much of the conflict between the states and the federal government and between the states themselves would presumably be eliminated; but there would nevertheless be need of more control of railway service. It must not be forgotten that government ownership is not an aim. It is a means. Standards of service, therefore, and the machinery for carrying them out are as necessary under one system as under another, altho it is probably true that the absence of any necessity on the part of separate railroads to earn dividends might make enforcement of some of the regulations of railway service easier. If the railroads were owned

by the government or operated by it as at present it would make little difference if Great Northern cars were used to haul ice from Maine to Boston, so far as the Great Northern itself would be concerned; but there would remain the inequalities of service between the shippers of the Northwest and those of New England.

A little consideration will show, too, that government ownership or government operation would not change the situation as it affects different classes of shippers within the same state. Reference is made here especially to the one-way and two-way shippers. What this means in actual practice may be shown by a concrete case which came before the Ohio Public Utilities Commission during its two-weeks hearings on coal shortage in February, 1917.[1] A Mr. Mobley, agent for the Baltimore and Ohio Railroad at Cincinnati, was asked to testify how many cars had been ordered by a long list of industrial concerns and what proportion of those ordered had been assigned to them. To take a typical case he replied that for the month of January, 1917, a certain steel and iron company ordered 89 cars and was furnished with 372. When asked to explain why more cars were supplied than were actually ordered, he pointed out that "furnished" in his records meant the number of loaded cars sent out by that mill over his line; that the discrepancy was due to the fact that that concern received large inbound shipments daily and that they were therefore able to provide themselves with most of the empties they needed and hence they did not need to ask the railroad for many in addition. The same result is seen in many of our agricultural states where there are many important grain shipping points that get very few cars in under load yet these are the very places that need large numbers of cars for outbound grain shipments. Other places in these states more populous and more

[1] These hearings were not printed.

diversified in their activities receive more inbound freight, and hence at times there is a very unequal distribution of railway equipment between different places in these states. Finally, the same situation presents itself on a still larger scale in the unequal distribution of equipment between different sections of the country. Government ownership would not change the essential characteristics of the one-way and two-way shippers or eliminate the fundamental features of our producing and consuming areas. But in any case justice and efficiency demand that control over railway service be taken out of the hands of the railroads, the shippers and the states and given to federal authorities, so organized that they can have a knowledge of local conditions and at the same time a view of transportation problems that extends beyond the boundaries of any state or traffic area. If it be contended that such control is placing railway management in the hands of government authorities who know nothing about it, the reply is that the railroads have confessed their inability to enforce their rules either against each other or against shippers; hence the public profits little by the fact that the railroads know what ought to be done. Railroad men and shippers of long experience should, however, be utilized by the government in its control of railway service. These men should be able to make equitable rulings which can be backed by the force of law, if necessary. With proper federal control shippers in our large and congested terminals might look forward to some plan of immediate delivery of less than car load shipments and more rigid rules for disposition of car load freight. Shippers in rural districts might realize that some storage room for grain plus improved highways would not only net them a better margin of profit but lessen the difficulties for themselves and the public generally which are

annually experienced because of their attempt to market their crops within a comparatively short period of time. Railroads now admit that regulations which have been forced upon them have increased their revenue, protected them against each other, and benefited the public. It is time shippers learned the same lesson.

To summarize, there is a danger that the war will be accepted as the cause of our unsatisfactory railway service. Furthermore, the popular idea that the trouble is mainly due to car shortage is a narrow view of the question. Evidence indicates that traffic has outgrown the transportation plant; and that for more than a decade whenever business has been brisk, railway service has been inadequate and inefficient. Assuming that under a system of private ownership sufficient revenue will be allowed to carriers to enable them to provide adequate facilities or that under government ownership they would be provided by the government itself, there would remain the question of the proper use of these facilities to prevent unfairness in the one case among railway systems and under either plan to prevent injustice among different classes of shippers and among various sections of the country. In other words government operation or government ownership will not eliminate the defects of railway service which are due in some cases to the strategic advantages which some groups of shippers enjoy, or in other instances to the size of our country and its geographical division of labor. These fundamental characteristics being the same under private or government ownership, there is a need in any case of more comprehensive regulation of railway service.

C. O. RUGGLES.

OHIO STATE UNIVERSITY.

APPENDIX

TABLE I

CAR SURPLUSES AND CAR SHORTAGES, JANUARY 2, 1907 TO OCTOBER 15, 1914, AND FEBRUARY 1, 1915, TO DECEMBER 1, 1917

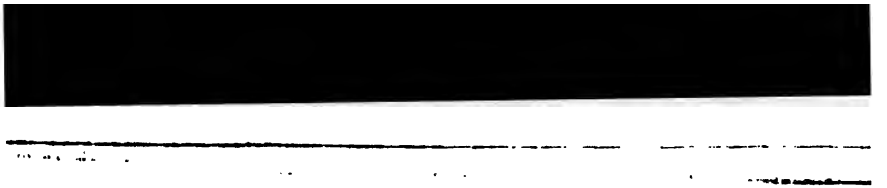
Date	Total Surplus	Total Shortage	Net Surplus	Net Shortage
1907				
Jan. 2	29,855	115,348	....	85,493
Feb. 6	12,018	149,865	....	137,847
April 10	15,037	96,154	....	81,117
May 15	21,437	55,428	....	33,991
May 29	24,945	42,970	....	18,025
June 12	32,325	40,343	....	8,018
June 26	32,859	34,458	....	1,599
July 10	58,183	20,813	37,370	....
July 24	50,954	18,753	32,201	....
Aug. 7	46,650	18,814	27,836	....
Aug. 21	40,477	22,628	17,849	....
Sept. 4	21,639	31,679	....	10,040
Sept. 18	17,251	64,920	....	47,669
Oct. 2	6,193	64,469	....	58,276
Oct. 16	4,258	85,764	....	81,506
Oct. 30	3,946	90,757	....	86,811
Nov. 13	12,201	57,003	....	44,802
Nov. 27	40,348	17,964	22,384	....
Dec. 11	119,339	4,520	114,819	....
Dec. 24	209,310	724	208,586	....
1908				
Jan. 8	341,763	653	341,110	....
Jan. 22	342,580	738	341,842	....
Feb. 5	343,928	1,100	342,828	....
Feb. 19	322,513	1,249	321,264	....
Mar. 4	314,992	1,619	313,373	....
Mar. 18	297,042	1,007	296,035	....
April 1	307,510	528	306,982	....
April 15	375,770	146	375,624	....
April 29	413,605	267	413,338	....
May 13	404,534	159	404,375	....
May 27	381,904	125	381,779	....
June 10	349,994	427	349,567	....
June 24	313,298	451	312,847	....
July 8	303,560	518	303,042	....
July 22	308,680	509	308,171	....
Aug. 5	281,621	635	280,986	....
Aug. 19	253,003	854	252,149	....
Sept. 2	222,632	1,418	221,214	....
Sept. 16	173,587	2,935	170,652	....
Sept. 30	133,792	8,114	125,678	....
Oct. 14	115,036	13,199	101,837	....
Oct. 28	110,912	10,839	100,073	....
Nov. 11	121,174	11,659	109,515	....
Nov. 25	132,829	9,210	123,619	....
Dec. 9	175,643	1,679	173,964	....
Dec. 23	222,077	1,019	221,058	....

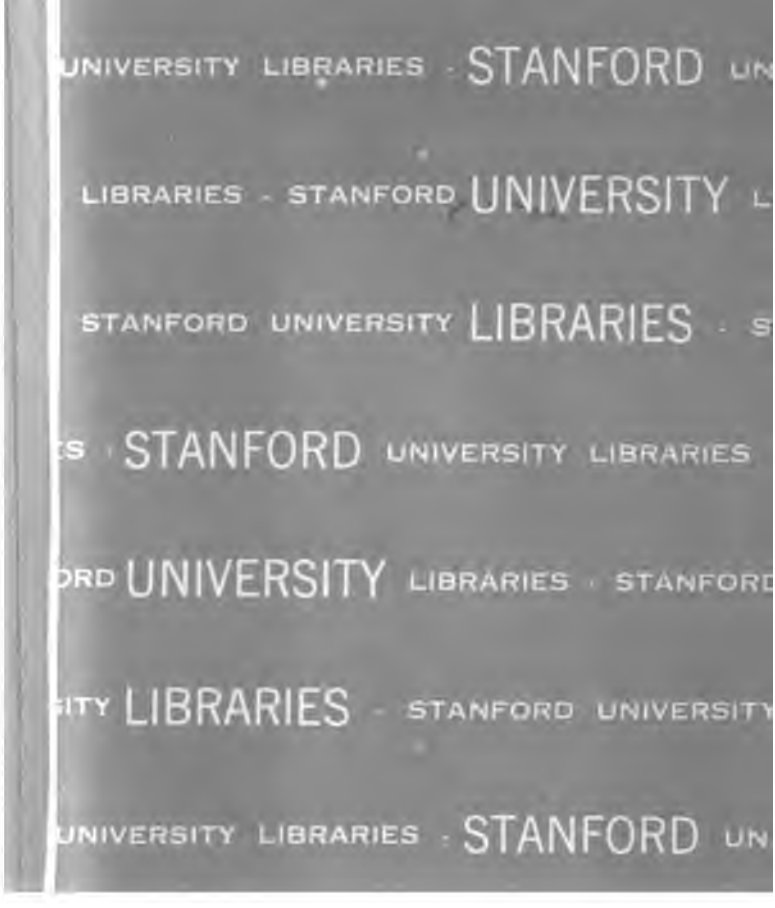
Date	Total Surplus	Total Shortage	Net Surplus	Sh
1909				
Jan. 6	333,019	506	332,513	
Jan. 20	311,664	358	311,306	
Feb. 3	301,571	288	301,283	
Feb. 17	301,441	470	300,971	
Mar. 3	299,925	685	299,240	
Mar. 17	291,418	550	290,868	
Mar. 31	296,600	399	296,201	
April 14	296,663	343	296,320	
April 28	282,328	497	281,831	
May 12	284,479	187	284,292	
May 26	273,890	1,240	272,650	
June 9	277,559	285	277,274	
June 23	262,944	827	262,117	
July 7	260,277	530	259,747	
July 21	243,324	339	242,985	
Aug. 4	207,173	1,626	205,547	
Aug. 18	159,424	2,009	157,415	
Sept. 1	110,576	3,899	106,677	
Sept. 15	78,798	7,425	71,373	
Sept. 29	53,388	14,582	38,806	
Oct. 13	35,977	23,431	12,546	
Oct. 27	30,896	36,636	....	
Nov. 10	36,616	39,902	....	
Nov. 24	39,528	27,496	12,032	
Dec. 10	57,470	18,593	38,877	
Dec. 22	58,354	24,054	34,300	
1910				
Jan. 5	52,309	13,893	38,416	
Jan. 19	51,836	24,992	26,844	
Feb. 2	51,600	26,625	24,975	
Feb. 16	45,513	31,204	14,309	
Mar. 2	45,315	29,907	15,408	
Mar. 16	44,529	27,187	17,342	
Mar. 30	45,672	19,786	25,886	
April 13	84,887	7,530	77,357	
April 27	102,085	5,766	96,319	
May 11	127,148	4,555	122,593	
May 25	115,390	4,729	110,661	
June 8	129,508	2,729	126,779	
June 22	125,644	3,011	122,633	
July 6	143,824	959	142,865	
July 20	134,594	1,293	133,301	
Aug. 3	105,564	2,783	102,781	
Aug. 17	78,760	5,081	73,679	
Aug. 31	60,022	9,293	50,729	
Sept. 14	54,890	7,814	47,076	
Sept. 28	42,469	17,941	24,528	
Oct. 12	33,735	20,419	13,316	
Oct. 26	29,131	21,896	7,235	
Nov. 9	34,581	21,000	13,581	
Nov. 23	43,060	14,673	28,393	
Dec. 7	53,915	11,901	42,014	
Dec. 21	62,118	10,705	51,413	

Date 1911	Total Surplus	Total Shortage	Net Surplus	Net Shortage
Jan. 4	110,432	3,508	106,924	....
Jan. 18	122,297	2,477	119,820	....
Feb. 1	156,355	1,287	155,068	....
Feb. 15	175,609	1,942	173,667	....
Mar. 1	192,673	2,831	189,842	....
Mar. 15	208,527	1,266	207,261	....
Mar. 29	196,217	1,330	194,887	....
April 12	187,219	1,166	186,053	....
April 26	189,524	2,518	187,006	....
May 10	188,847	1,569	187,278	....
May 24	168,233	835	167,398	....
June 7	169,006	2,204	166,802	....
June 21	165,934	2,764	163,170	....
July 5	165,508	1,887	163,621	....
July 19	150,433	1,361	149,072	....
Aug. 2	130,136	2,045	128,091	....
Aug 16	108,000	3,830	104,170	....
Aug. 30	88,866	4,325	84,541	....
Sept. 13	70,722	6,439	64,283	....
Sept. 27	58,382	8,344	50,038	....
Oct. 11	48,854	12,957	35,897	....
Oct. 25	39,306	18,774	20,532	....
Nov. 8	45,290	18,776	26,514	....
Nov. 22	43,059	19,949	23,110	....
Dec. 6	53,840	17,697	36,143	....
Dec. 20	88,646	11,832	76,814	....
1912				
Jan. 3	142,316	6,378	135,938	....
Jan. 17	102,479	12,194	90,285	....
Jan. 31	55,592	23,011	32,581	....
Feb. 14	50,886	36,928	13,958	....
Feb. 28	44,984	37,142	7,842	....
Mar. 13	46,028	42,985	3,043	....
Mar. 27	52,682	33,974	18,708	....
April 11	94,943	15,554	79,389	....
April 25	151,186	12,305	138,881	....
May 9	136,776	6,678	130,098	....
May 23	123,683	7,482	116,201	....
June 6	89,208	2,822	86,386	....
June 20	73,464	5,746	67,718	....
July 4	70,731	6,707	64,024	....
July 18	75,389	6,467	68,922	....
Aug. 1	65,904	9,394	56,510	....
Aug. 15	58,623	14,722	43,001	....
Aug. 29	36,047	26,297	9,750	....
Sept. 12	27,380	36,000	....	8,620
Sept. 26	26,754	44,547	....	17,793
Oct. 10	22,810	54,389	....	31,579
Oct. 24	17,289	67,270	....	49,981
Nov. 7	19,897	71,156	....	51,259
Nov. 21	22,363	73,475	....	51,112
Nov. 30	26,135	62,536	....	36,401
Dec. 14	26,614	61,006	....	34,392
Dec. 31	50,659	33,601	17,058	....

Date	Total Surplus	Total Shortage	Net Surplus	S
1913				
Jan. 15	53,230	24,791	28,439	
Feb. 1	62,045	24,785	37,260	
Feb. 15	52,700	30,517	22,183	
Mar. 1	58,529	27,148	31,381	
Mar. 15	57,998	20,223	37,775	
April 1	68,792	10,804	57,988	
April 15	70,715	13,217	57,498	
May 1	53,977	14,178	39,799	
May 15	61,269	10,975	50,294	
May 31	60,291	9,383	50,908	
June 14	71,126	7,199	63,927	
June 30	70,740	7,036	63,704	
July 15	76,280	6,875	69,405	
Aug. 1	69,716	11,261	58,455	
Aug. 15	69,253	14,828	54,425	
Sept. 1	73,576	15,270	58,306	
Sept. 15	61,753	21,594	40,159	
Oct. 1	41,994	31,620	10,374	
Oct. 15	37,198	43,246	....	
Nov. 1	38,276	40,118	....	
Nov. 15	46,059	23,407	22,652	
Dec. 1	67,466	10,212	57,254	
Dec. 15	107,513	5,968	101,545	
1914				
Jan. 1	190,521	1,671	188,850	
Jan. 15	217,274	2,385	214,889	
Feb. 1	211,960	2,282	209,678	
Feb. 14	199,385	2,333	197,052	
Mar. 1	159,480	5,573	153,907	
Mar. 15	132,010	7,145	124,865	
April 1	141,525	2,013	139,512	
April 15	213,324	455	212,869	
May 1	230,533	1,654	228,879	
May 15	239,406	764	238,642	
June 1	242,572	770	241,802	
June 15	232,994	660	232,334	
July 1	220,875	1,333	219,542	
July 15	228,384	1,843	226,541	
Aug. 1	198,998	2,333	196,665	
Aug. 15	174,260	2,115	172,145	
Sept. 1	165,244	1,918	163,326	
Sept. 15	138,108	2,059	136,049	
Oct. 1	133,382	2,355	131,027	
Oct. 15	154,342	2,360	151,982	

Date	Total Surplus	Total Shortage	Net Surplus	Net Shortage
1915				
Feb. 1	280,573	1,162	279,411	....
Mar. 1	322,290	543	321,747	....
April 1	327,441	357	327,084	....
May 1	292,269	966	291,303	....
June 1	300,146	218	299,928	....
July 1	276,421	785	275,636	....
Aug. 1	266,312	948	265,364	....
Sept. 1	191,309	6,300	185,009	....
Oct. 1	88,351	10,010	78,341	....
Nov. 1	55,793	27,525	28,268	....
Dec. 1	60,793	23,391	37,402	....
1916				
Jan. 1	70,391	23,310	47,081	....
Feb. 1	53,611	33,312	20,299	....
Mar. 1	43,025	62,562	....	19,537
April 1	52,274	47,636	4,638	....
May 1	63,344	29,983	33,361	....
June 1	70,310	12,617	57,693	....
July 1	68,035	15,801	52,234	....
Aug. 1	49,753	39,991	9,762	....
Sept. 1	45,044	64,917	....	19,873
Sept. 30	34,157	94,854	....	60,697
Nov. 1	24,837	139,745	....	114,908
Dec. 1	21,166	128,944	....	107,778
Dec. 31	39,635	101,882	....	62,247
1917				
Feb. 1	27,069	137,057	....	109,988
Mar. 1	25,294	155,376	....	130,082
Mar. 31	19,467	164,264	....	144,797
May 1	19,026	167,653	....	148,627
June 1	23,850	130,449	....	106,649
June 30	28,669	106,351	....	77,682
Aug. 1	43,481	77,257	....	33,776
Sept. 1	50,783	85,388	....	34,605
Oct. 1	24,297	96,873	....	72,576
Nov. 1	11,293	159,787	....	148,494
Dec. 1	12,122	132,036	....	119,914

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